

ADDITIONAL NOTES ON THE GENUS VERBENA. XV

Harold N. Moldenke

VERBENA [Dorst.] L.

Additional & emended bibliography: Rivin., *Introd. Gen. Rem Herb. Ord. Pl. Irreg. Monop.* [24], pl. [56] & [57]. 1690; P. M. Rodríguez, *Pl. Medic. Parag.* 109--111. 1915; R. W. Br., *Compos. Scient. Words* 460, 832, & 833. 1954; Humbert, *Fl. Sahara Sept. & Cent.* 405--407, fig. 149. 1958; H. H. Iltis, *Prelim. Check List Ferns Seed Pl. Upham Woods*, ed. 1, 12. 1960; Quezel & Santa, *Nouv. Fl. Alg.* 2: 779 & 780. 1963; H. H. Iltis, *Prelim. Check List Ferns Seed Pl. Upham Woods*, ed. 2, 12. 1968; Beebe & Hoffm., *Am. Midl. Nat.* 80: 96, 99, 101, & 103. 1968; J. E. Weaver, *Prairie Pl.* 204, 206, & 275. 1968; Burbidge & Gray, *Fl. Austr. Cap. Terr.* 310, 313, & 445, fig. 312. 1970; McMinn, *Allan Cunningh.* 9. 1970; Mahler, *Key Vasc. Pl. Black Gap*, ed. 3, 69--71, 104, & 109. 1971; Thetford, Pieper, & Nels., *Journ. Range Manag.* 24: 425--431. 1971; Anon., *Biol. Abstr.* 53 (7): B.A.S.I.C. S.270. 1972; A. H. D., *Biol. Abstr.* 53: 3496. 1972; Moldenke, *Phytologia* 23: 366--389, 413--473, 505--507, 509, & 512. 1972; Cody, *Ind. Sem.* 1972: 25. 1972; W. A. Weber, *Rocky Mtn. Fl.* 305--306 & 437. 1972.

The Rivinius work (1690), cited in the above bibliography, is sometimes cited as "Rivin., *Ord. Pl. Irreg. Monop.* 81, t. 56". The New York Botanical Garden Library's copy of this work has the plates unnumbered, but the one depicting Verbena is actually the 56th in sequence. The page of text on which the name occurs is also unnumbered, but is the 24th in the series which begins with numbered pages. Possibly in some other extant copies of this work the pages are in a different sequence and it is the 81st. The work is dated "1691--1717" by some bibliographers.

R. W. Brown (1954) reminds us that the Latin word "lustrago, -inis, f." refers to "a kind of vervain, just as the Greek word "hierobotane, f." is also the name for a vervain known to the ancients [actually, Verbena officinalis L.]

Thetford, Pieper, & Nelson (1971) report that species of this genus constitute important forbs in sheep diets.

Leverett (1852) misspells the common name for members of this genus as "vervaing".

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Mahler, *Keys Vasc. Pl. Black Gap*, ed. 3, 70. 1971; Moldenke, *Phytologia* 23: 367, 426, & 431. 1972; W. A. Weber, *Rocky Mtn. Fl.* 305. 1972.

VERBENA BONARIENSIS L.

Additional bibliography: Burbidge & Gray, *Fl. Austr. Cap. Terr.* 310, 313, & 445, fig. 312. 1970; Moldenke, *Phytologia* 23: 367, 418, & 419. 1972.

Additional illustrations: Burbidge & Gray, *Fl. Austr. Cap.*

Terr. 313, fig. 312. 1970.

Burbidge & Gray (1970) comment that this species is "Of South American origin but naturalised in New South Wales, Victoria, and South Australia; a roadside weed in the A. C. T. [=Australian Capital Territory] where it flowers in summer" and is called "purple-top".

VERBENA BRACTEATA Lag. & Rodr.

Additional bibliography: Moldenke, *Phytologia* 23: 367, 374, 413, 414, 419, & 426. 1972; W. A. Weber, *Rocky Mtn. Fl.* 306. 1972.

VERBENA BRASILIENSIS Vell.

Additional bibliography: Moldenke, *Phytologia* 23: 259, 265, 291--293, 371, 413, 414, & 435. 1972.

It should be noted here that the I. S. Gottsberger 143 [4], cited in a previous installment of these notes as being deposited in the herbarium of the Fairchild Tropical Garden is actually in that of the Texas Research Foundation at Renner, Texas, instead.

In June, 1972, my wife, my son, and I observed this species growing abundantly along moist roadsides in Stanislaus County, California.

VERBENA CANESCENS H.B.K.

Additional bibliography: Mahler, *Keys Vasc. Pl. Black Gap*, ed. 3, 70. 1971; Moldenke, *Phytologia* 23: 219--220 & 373--375. 1972.

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry

Additional bibliography: Mahler, *Keys Vasc. Pl. Black Gap*, ed. 3, 70. 1971; Moldenke, *Phytologia* 23: 219--220, 374, & 375. 1972. Mahler (1971) calls this the "Roemer verbena".

VERBENA CILIATA Benth.

Additional bibliography: Mahler, *Keys Vasc. Pl. Black Gap*, ed. 3, 70. 1971; Moldenke, *Phytologia* 23: 220, 237, 302, & 370. 1972.

xVERBENA COVASII Moldenke

Additional bibliography: Moldenke, *Phytologia* 23: 194--195. 1972.

Emended illustrations: Schnack & Covas, *Darwiniana* 7: 78, fig. 2B, pl. 1 D, & pl. 5 A--G. 1945.

VERBENA CRITHMIFOLIA Gill. & Hook.

Additional bibliography: Moldenke, *Phytologia* 23: 368 & 426. 1972.

The Zöllner 5417, distributed as V. crithmifolia, is actually V. parodii (Covas & Schnack) Moldenke.

VERBENA HASTATA L.

Additional bibliography: Rivin., *Introd. Gen. Rem Herb. Ord. Pl. Irreg. Monop.* [24], pl. [57]. 1690; R. W. Br., *Compos. Scient. Words* 833. 1954; Moldenke, *Phytologia* 23: 368, 413, 414, & 435--

437. 1972; Cody, Ind. Sem. 1972: 25. 1972; W. A. Weber, Rocky Mtn. Fl. 306. 1972.

Schuett & Roe collected this plant on a sandy shore with Cyperus and Scirpus and thought that it might represent a hybrid, but their specimen seems to be typical dwarfed V. hastata.

Additional citations: NORTH CAROLINA: Avery Co.: Leonard & Russ 2634 (N). WISCONSIN: Marquette Co.: Schuett & Roe 92 (Ws).

xVERBENA HYBRIDA Voss

Additional bibliography: McMinn, Allan Cunningh. 9. 1970; Burbidge & Gray, Fl. Austr. Cap. Terr. 11, 92, 93, & 431. 1970; Moldenke, Phytologia 23: 368--369, 417, 426, & 436. 1972.

McMinn (1970) asserts that Allan Cunningham and James Bowie "are generally credited with having introduced to England from Brazil the Verbena, which was later to develop under hybridization into one of the most popular of ornamentals".

VERBENA LACINIATA (L.) Briq.

Additional & emended bibliography: Schnack & Covas, Darwiniana 7: [71]--75 & 77--79, pl. 1 D--F, 3 A, & 5 A--G. 1945; Schnack & Solbrig, Revist. Fac. Agron. La Plata 29: [255]--266, fig. 1--4. 1953; Moldenke, Phytologia 23: 369, 377, 430, & 435. 1972.

Emended illustrations: Schnack & Covas, Darwiniana 7: pl. 1 E & F, 3 A, & 5 B. 1945; Schnack & Solbrig, Revist. Fac. Agron. La Plata 29: 257, 261, & 263, fig. 1 A & B, 3 A & B, & 4 A & G. 1953.

The Herrera 3450, originally distributed as V. laciniata, is actually V. microphylla H.B.K.

VERBENA OFFICINALIS L.

Additional & emended synonymy: Verbena communis coeruleo flore C. Bauh. ex Tourn., Compl. Herb. 357. 1719. Verbena mas seu recta & vulgaris Parkinson ex Tourn., Compl. Herb. 357, in syn. 1719.

Additional & emended bibliography: Rivin., Introd. Gen. Rem Herb. Ord. Pl. Irreg. Monop. [24], pl. [56]. 1690; P. M. Rodríguez, Pl. Medic. Parag. 109--111. 1915; Quezel & Santa, Nouv. Fl. Alg. 2: 780. 1963; Moldenke, Phytologia 23: 377--389, 414, 419, 421--423, 435--437, 460--473, & 511. 1972.

Emended illustrations: Rivin., Introd. Gen. Rem Herb. Ord. Pl. Irreg. Monop. pl. [56]. 1690.

The Rivinius work (1690), cited above, is sometimes cited as "Rivin., Ord. Pl. Irreg. Monop. 81, t. 56". The copy of this work in the library of the New York Botanical Garden has the plates unnumbered, but the one depicting this species is 56th in the series -- perhaps in some extant copies of the work the plates have been numbered by hand. Also the page on which the text explaining the illustration appears is 24th in the series of pages following the numbered ones -- perhaps in other copies of the work the pages are bound differently and it is there the 81st. The work is cited as "1691--1717" by some bibliographers.

Tournefort (1719) records the common name "common vervain with a blue flower" for this species. Rodríguez (1915) adds "colombaria", "hierba buena", "hierba culumbina", "hierba cruz", "hierba de Santiago", "hierba sagrada", "hierba turca", "verbena común", and "yerba de todos los males". He also notes that in Paraguay V. officinalis "existe en abundancia en nuestro país". If this is true, then it does seem passing strange that in my 45 years of work on this group I have not as yet seen a single specimen of the species from Paraguay! He seems most probable to me that the various medicinal uses which he gives for this plant have been taken wholly from European literature. In fact, he notes that "Algunos autores, dicen que apenas tiene uso actualmente. Sin embargo, habia yo notado desde hace años la verdadera insistencia y fé con que empleaban muestras gentes de campaña. Y hasta en ocasiones soureía. La práctica, esa madre de la ciencia ha venido sin embargo á corroborar sa empleo. Es pues mi objeto levantar un milímetro más, el nivel que ocupa actualmente nuestra humilde verbena, dando á conocer el veredicto de competentes en la materia. De paso anotaremos que Plinio, Virgilio y Propercio afirmaban que era empleada la verbena en ciertas ceremonias entre los druidos y los celtas; entre los romanos para purificar los altares y quitarles el polvo; en los filtros amorosos como afrodisiacos, las pitonisas se adornaban la frente con ella para sus predicciones; y finalmente, era la yerba sagrada de los heraldos pues proclamaban la guerra, teniendo á su lado un hombre con un ramito de verbena en la mano."

He then quotes Mathioli: "Mathiolo, botánico sienés fué quien asignó á la verbena propiedades febrifugas, ratificando á su vez la creencia de que los ramos del primer nudo son útiles en las fiebres diarias, las tercianas en las tercianas etc. Considero util y de peso científico, copiar sus palabras: 'Las hojas, dice, tomadas con vino así como la raíz, sirve aplicada en forma de emplastro sobre la mordedura de víbora; bebida en cantidad de una dracma (3 grs. 88 centgs.) en un cortadillo de vino añejo, con tres ovulos de incienso por cuarenta días y en ayunas es util en los derrames de bilis; mitiga bajo la forma de emplastro las postemas crónicas y la inflamación y modifica las úlceras sórdidas. El cocimiento de toda la planta en gargarismos corrige las anginas y cierra las úlceras corrocivas de la boca. Dícese que rociando con su cocimiento á las comensales en los banquetes les aliegra. Las hojas, desde el tercer nudo, á contar desde el suelo, se usan contra las tercianas y al partir del cuarto, en las cuartanas.'

"El Dr. Ricci refiere: quen en un viaje realizado á la provincia del Siena y especialmente en Val de Orcia donde reinaba la fiebre malaria, pudo observar los buenos resultados que se obtenía para cortar la calentura, con un cocimiento de hojas de verbena. Dicha preparación tenía la ventaja sobre la quinina, do no producir recedivas, en tanto que la acción de este alcaloide, vuelven por cualquier exeso en las comidas ó por exponerse al fresco de la madrugada ó anochecer.

"Se administraba en la siguiente forma: 5 gramos de hoja en medio litro de agua hirviendo. Se apuraba el cocimiento hasta reducirlo por la mitad. Colado, tomaban todas las mañanas en ayunas durante varios días.

"Setiembre era cuando más usaban porque afirmaban que en esos meses y en todo el Otoño, la quinina producía muy poco efecto.

"Ensayado luego por el mismo médico en algunos casos de intermitentes, en lo que varios fueron rebeldes á la quinina, pudo comprobar sus buenos resultados y le impulsaron á proseguir.

"Estos buenos resultados se manifestaron según la gravedad y el tiempo que venían padeciéndose, ya á los ocho días y hasta á los quince; en un solo caso me vi precisado á continuar su uso por veinte días, para que no volviese á aparecer la fiebre.

"Sin tener en cuenta á que nudo pertenecían las hojas arrancadas ni el tipo de la intermitente preparaba un cocimiento y administraba, no de una sola vez sino 2 ó 3 veces diarios después de desaparecer la calentura.

"Y finalmente concluía: 'No dispuse á enfermo alguno, prescripciones especiales, como la dieta, resguardarse del relente de la madrugada y de la noche, todo con objeto de comprobar la verdad de lo que venía asegurándose sobre la acción benéfica de esta planta en las intermitentes, independiente de toda precaución.

"Me prometo ante de nuevos experimentos, conocer analíticamente la Verbena officinalis, para poderme explicar á que principio ó por que mecanismo dinámico puede actuar sobre el proceso febril.'.....

"Un anciano me decía hace poco: 'Nunca se olvide que en ciertos días, el cuerpo fatigado, el estómago é intestino se transforman á consecuencia de la mala calidad de nuestra alimentación, sobreviniendo efectos que se producen por una fiebre de origen gástrico, poca gana de tomar alimentación dolores en el bajo vientre y languidez. En esos casos, rinde muy buen resultado un decocto de verbena con un pocde azúcar tomado en ayunas. Con ello, el apetito vuelo ve y la fiebre desaparece."

Quezel & Santa (1963) state that V. officinalis is found wild "dans toute l'Algérie". Panigrahi & Saran (1967) cite their 1516 & 10627 from Tehrihat, India; Esfandiari (1967) cites Behboud s.n. [29.7.49], Bogomolov s.n. [1947], Mir-kamali s.n. [2.9.65], and Scharif s.n. [28.5.49] from Iran.

Pampanini (1930) cites Giannattasio s.n. [Cirene, 1926], Petrovich s.n. [Benghasi, 1880-1884], Ruhmer s.n. [Bengasi, 1883], and Vaccari s.n. [Derna, 1912] from Cyrenaica. Druce (1897) cites from England the following collections: Batson s.n. [Wickham], Bellamy s.n. [Ilsley], F. W. Bennett s.n. [Wittenham], Bunny s.n. [near Bucklebury Parsonage] & s.n. [Itchenswell], J. Frances s.n. [between Didcot and Upton], Lousley s.n. [Blewbury] & s.n. [Hampstead Norris], M. Niven s.n. [Carswell], Pamplin s.n. [Streatley], Penny s.n. [Wellington College], W. M. Rogers s.n. [Chieveley], S. Rudge s.n. [Sonning, 1800], Stanton s.n. [Wargrave],

Tafnail s.n. [Shinfield], and Walker s.n. [Mareham].

Patzak & Rechinger (1967) reduce V. tenuispicata Stapf to synonymy under V. officinalis and cite: IRAQ: Barkley 9071, Guest 2994 & 3044, Rechinger 11517. IRAN: Behboudi 1266, Borrmüller 5127, Buhse s.n., Bunge s.n., Furse 2841, Gauba 903, Grant 16057 & 16081, Knapp s.n., Koeie 770 & s.n., Koelz 15757, 16144, 16839, & 18192, Lindsay 375 & 1026, Manucheri s.n., Martinez de la Escalera s.n., Rechinger 1083, 1805, & 5255, Sab. s.n., Sintenis 1328, Stapf s.n., Starmühlner 1071, Str. s.n. U.S.S.R.: Turkmanskaya: Lipsky s.n. AFGHANISTAN: Amsel s.n., Chaworth-Musters s.n., Edelberg 1110 & 1788, Hedge & Wendelbro 3770 & 4327, Koeie 3151, Koelz 11593, 11785, 13246, & 13501, Lindberg 557, Neubauer 1950/737, Rechinger 17061 & 19229, Volk K.134. PAKISTAN: Blatter, Hallberg, & McCann 225 & 346, Rechinger 30231 & 30270, Stewart s.n. Kapoor (1968) cites Srivastava & Party 29701 from Kashmir.

Priszter (1971) offers seeds of Verbena officinalis under his seed packets no. 1670 and 2645.

Additional citations: DELAWARE: New Castle Co.: Canby s.n. [July] (Pa). DISTRICT OF COLUMBIA: Sudworth s.n. [8 June 1890]. NORTH CAROLINA: Catawba Co.: Small & Heller s.n. [June 25-26, 1891] (Lk). SOUTH CAROLINA: Aiken Co.: Canby s.n. [May 1858] (Pa). CALIFORNIA: San Diego Co.: Edw. Palmer 304 (Pa). NORWAY: Ellingsen s.n. [Aug. 1879] (Go), s.n. [14/8/1889] (Go). SWEDEN: Blom s.n. [7/7/1948] (Go), s.n. [23/XI/1951] (Go), s.n. [12/10/1952] (Go), s.n. [18/9/1955] (Go), s.n. [17/8/1956] (Go), s.n. [16/8/1957] (Go); Brandt s.n. [15/8/1952] (Go), s.n. [24/7/1953] (Go); H. Fries s.n. [12/9/1947] (Go). DENMARK: A. Hensen s.n. [31/8/1898] (Go). FRANCE: Herb. Mus. Paris. s.n. (N). PORTUGAL: F. Lemos 157 (N). SWITZERLAND: Bernet s.n. [Genève] (Se--158842); G. Kohler 114 (Se--227366). GREECE: Ferguson & Natzio 827 (W--2437950). ITALY: Kuntze s.n. [Genua, 18/V/67] (W--2505561). ETHIOPIA: C. C. Albers 62132 (Au--223637). ZAMBIA: E. A. Robinson 5596 (N). IRAN: Koelz 15757 (W--2188876), 16144 (W--2189170), 16839 (W--2189631). PAKISTAN: Karachi: Quaiseo 259. NEPAL: Banerjee & Shakya 5596 (W--2581495). INDIA: East Punjab: R. E. Cooper 5045 (Mi). CHINA: Szechuan: Farges 832 bis (W--2496749). THAILAND: Larsen, Santisuk, & Warncke 2937 (Ac). JAPAN: Honshu: Murata 27359 (W--2409960). RYUKYU ISLAND ARCHIPELAGO: Amamioshima: Hosoyamada s.n. [July 23, 1927] (W--2071188). Ishigaki: F. R. Fosberg 37244 (Rf); Masamune & Mori s.n. [July 31, 1934] (Tw); A. Smith 50 (W--2156896), 211 (W--2156952). Kurema: Okuhara & Sunagawa 22 (Rf). Okinawa: Beauchamp 1178 (W--2620617); Field & Loew 21t (W--1942622), 96e (W--1942760); R. Moran 5066 (W--2186564); A. R. Phillips 46 (W--2187038), 105 (W--2245938); E. H. Walker 7557 (W--2129627), 8101 (Ac, W--2619389). Island undeter-

mined: C. Wright s.n. [Loo-choo Islands] (W--73001). FORMOSA: Chuang & Kao 4544 (N). NEW ZEALAND: North: H. H. Allan s.n. (Nz--1164). South: Healy 59/408 (Nz--118197); Kilworth s.n. [1/2/1961; Herb. Bot. Div. D. S. I. R. 118429] (Nz--118429, Rf). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [Tzschetschnow, Juli 1933] (Pa); Herb. A. Brown s.n. (N).

VERBENA OFFICINALIS var. ALBIFLORA Strobil

Additional synonymy: Verbena communis floribus albidis Tourn. ex Manetti, Virid. Florent. 98. 1751. Verbena communis, floribus albidis Seguiet ex Bertol., Fl. Ital. 6: 260, in syn. 1844.

Additional bibliography: Tourn., Compl. Herb. 357. 1719; Manetti, Virid. Florent. 98. 1751; Gussone, Fl. Sic. Prodr. 2: 145. 1828; Bertol., Fl. Ital. 6: 260. 1844; Moldenke, Phytologia 11: 475. 1965; Gilkey & Dennis, Handb. NW. Pl. 353. 1967; Moldenke, Fifth Summ. 1: 207 (1971) and 2: 604, 668, 686, & 917. 1971; Moldenke, Phytologia 23: 444. 1972.

Gussone (1828) does not name this variety, but describes it as "Floribus albis variat, quae rarior, sed magis obvia cum floribus coerulesis. In icone Sabbat. flores duplo majores". Tournefort (1719) calls it the "common vervain with white flowers". Gilkey & Dennis (1967) assert that about Portland, Oregon, this white-flowered variety is more common than the normal purplish-flowered form.

VERBENA OFFICINALIS var. ANARRHINOIDES Murr

Additional bibliography: Moldenke, Phytologia 10: 278--279. 1964; Moldenke, Fifth Summ. 1: 205 (1971) and 2: 917. 1971.

VERBENA OFFICINALIS var. BRACHYANTHA Murr

Additional bibliography: Moldenke, Phytologia 10: 279. 1964; Moldenke, Fifth Summ. 1: 206 (1971) and 2: 917. 1971.

VERBENA OFFICINALIS var. GAUDICHAUDII Briq.

Additional bibliography: Moldenke, Phytologia 11: 475. 1965; Moldenke, Fifth Summ. 1: 349 & 371 (1971) and 2: 687 & 917. 1971.

VERBENA OFFICINALIS var. GRACILIS G. Cta.

Additional bibliography: Moldenke, Phytologia 10: 280. 1964; Moldenke, Fifth Summ. 1: 203 (1971) and 2: 917. 1971.

VERBENA OFFICINALIS var. GRANDIFLORA Hausskn.

Additional bibliography: Moldenke, Phytologia 11: 475. 1965; Moldenke, Résumé Suppl. 17: 7. 1968; Moldenke, Fifth Summ. 1: 206 & 350 (1971) and 2: 917. 1971.

Hodgkins says that "Round Auckland [New Zealand] in waste places & roadsides, uncommon, also seen at Great Barrier Island and at Okoivone in the Waikato; usually squamose or ascending or rarely erect 1--2 ft. high, fls. nearly double the diameter of Verbena officinalis. It is very scarce in all the localities seen."

Citations: NEW ZEALAND: North: Hodgkins 5 (Nz--2052).

VERBENA OFFICINALIS var. LATILOBA Sennen

Bibliography: Moldenke, Fifth Summ. 1: 205 (1971) and 2: 917. 1971.

The collection cited below is probably the type collection of this variety. It bears the following description, apparently by Sennen: "feuilles supérieures entières à limbe large, ainsi que ses lobes des feuilles caulinaires; longe épis". It is possible that this may be the variety described by Haller (1768) as having "Foliis vix dissectis" and by Bertolini (1844) as "foliis non, vel parum dissectis".

Citations: SPAIN: Gonzalo s.n. [Sennen 4845] (N--isotype).

VERBENA OFFICINALIS var. MACROSTACHYA Benth.

Additional bibliography: Moldenke, Phytologia 11: 475. 1965; Moldenke, Fifth Summ. 1: 208, 349, & 371 (1971) and 2: 682, 687, & 918. 1971.

VERBENA OFFICINALIS f. MONTANA Goiran

Additional bibliography: Moldenke, Phytologia 10: 281. 1964; Moldenke, Fifth Summ. 1: 206 (1971) and 2: 918. 1971.

VERBENA OFFICINALIS var. PROSTRATA Gren. & Godr.

Synonymy: Verbena officinalis var. prstrata Gren. & Godr. ex Moldenke, Résumé Suppl. 17: 7, sphalm. 1968.

Additional bibliography: Moldenke, Phytologia 11: 475. 1965; Moldenke, Résumé Suppl. 17: 7. 1968; Moldenke, Fifth Summ. 1: 205, 206, 211, 213, & 350 (1971) and 2: 687 & 918. 1971.

This plant has been collected in flower and fruit in January. It is said to be "abundant throughout" North Island, New Zealand, where Healy describes it as "anomalous plants: stalks closely appressed to ground."

Additional citations: ERITREA: Pappi 4331 (W--2483955). NEW ZEALAND: North: Healy 50/64 (Nz--70249a); "L. B. M." s.n. [Te Kaha, 1.3.41] (Nz--34326).

VERBENA OFFICINALIS var. RESEDIFOLIA Murr

Additional bibliography: Moldenke, Phytologia 10: 282. 1964; Moldenke, Fifth Summ. 1: 206 & 208 (1971) and 2: 918. 1971.

xVERBENA OKLAHOMENSIS Moldenke

Additional bibliography: Moldenke, Phytologia 16: 191. 1968; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1317 & 1324. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Moldenke, Fifth Summ. 1: 47, 53, & 59 (1971) and 2: 654, 658, & 918. 1971; Moldenke, Phytologia 22: 471. 1972.

Unfortunately, this binomial was inadvertently written as that of a true species in the Correll & Johnston work (1970) cited above.

VERBENA ORCUTTIANA Perry

Additional bibliography: Moldenke, *Phytologia* 16: 191. 1968; Moldenke, *Fifth Summ.* 1: 76 (1971) and 2: 918. 1971.

Moran found this plant to be "locally common" in dry meadows and occasional in open grass areas in pine forests and "occasional in Jeffrey pine forest" in Baja California. The corollas are said to have been "blue" on R. V. Moran 13604 and "blue-violet" on R. V. Moran 13476.

Additional citations: MEXICO: Baja California: R. V. Moran 13476 (Sd--63645), 13596 (Sd--63433), 13604 (Mi, N, Sd--63504, W--2553382).

VERBENA ORIGENES R. A. Phil.

Additional & emended bibliography: R. A. Phil., *Viage Des. Atac.* 214. 1860; Sanzin, *Anal. Soc. Cient. Argent.* 88: 98, 127--129, & 134, fig. 32. 1919; I. M. Johnst., *Rev. Soc. Argent. Cienc. Nat.* 9: 317. 1929; J. A. Clark, *Card Ind. Gen. Sp. Var.* issue 183. 1944; Moldenke, *Phytologia* 16: 191. 1968; Moldenke, *Fifth Summ.* 1: 193 (1971) and 2: 521, 665, 688, & 918. 1971; Moldenke, *Phytologia* 23: 426. 1972.

Emended illustrations: Sanzin, *Anal. Soc. Cient. Argent.* 88: 128, fig. 32. 1919.

Johnston (1929) says "I refer here collections from talus at ca. 3300 m. alt. in the gorge above Bafios de San Crispin (J. 6102) and from a dry gravelly bench at ca. 2900 m. alt. in Queb. del Cadillo (J. 6154). The coarse simple or subsimple stems are erect or somewhat decumbent at the base. They spring from a low woody caudex and form a plant usually 3--6 dm. tall. The corollas are pale bluish. My collections are obviously conspecific with those illustrated and treated as V. origenes Ph. by Sanzin.....The type of V. origenes Ph., Linnaea, XXIX, 20 (1857), is a poor specimen lacking corollas. It came from the high cordilleras of Coquimbo and, as far as comparisons can be made, is indistinguishable from the type of V. palmata Reiche, *Fl. Chile*, V, 287 (1910), which also came from the same general region and perhaps even from the same territory in the vicinity of Bafios del Toro. Reiche's V. palmata is distinguished from the plant he called V. origenes by the smaller anthers and lack of stiped protruding staminal appendages. As the plant which lacks appendages ranges from the cordilleras southeast of Copiapó to east of Coquimbo and appears to be the only one with its characteristic habit in the area, I feel confident that V. origenes Ph. is the same species as V. palmata Reiche and that Philippi's name should be applied to the concept which Reiche described as V. palmata. The plants with well developed, salient staminal appendages which grow in the cordilleras of Aconcagua, Mendoza and San Juan, are indistinguishable from V. deserticola Ph., of the mountains east of Copiapó, except that their leaves are somewhat more abundantly lobed, the lobes somewhat more obtuse and the plants as a whole a trifle more stiff and scabrid. These

differences, however, seem minor ones and I am treating my collections as referable to that species, although realizing that they might be treated as varietally distinct."

Additional citations: CHILE: Coquimbo: J. L. Morrison 17271 (Se--120439); Zöllner 4087 (Go).

VERBENA ORIGENES var. GLABRIFLORA Moldenke

Additional bibliography: Moldenke, *Phytologia* 16: 191. 1968; Moldenke, *Fifth Summ.* 1: 193 (1971) and 2: 918. 1971.

VERBENA ORIGENES var. SEMPERI Moldenke

Additional bibliography: Moldenke, *Phytologia* 10: 288. 1964; Moldenke, *Fifth Summ.* 1: 202 (1971) and 2: 918. 1971.

xVERBENA OSTENI Moldenke

Additional bibliography: Moldenke, *Phytologia* 11: 475. 1965; Moldenke, *Fifth Summ.* 1: 178 & 190 (1971) and 2: 683, 689, 690, 702, & 918. 1971.

Additional citations: BRAZIL: Rio Grande do Sul: Palacios & Cuezco 340 (N).

VERBENA OVATA Cham.

Additional & emended bibliography: Noack, *Biol. Zentralbl.* 57: 384--386, fig. 13. 1937; Darlington & Wylie, *Chrom. Atl.*, pr. 1, 323. 1956; Moldenke, *Phytologia* 16: 191. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 717. 1969; Moldenke, *Fifth Summ.* 1: 178, 188, 202, & 371 (1971) and 2: 655 & 918. 1971; Moldenke, *Phytologia* 22: 478 (1972) and 23: 419. 1972.

Illustrations: Noack, *Biol. Zentralbl.* 57: 386, fig. 13. 1937.

Krapovickas and his associates found this plant growing "en vega, borde de arroyo", fruiting in December. The Cowgill 903, cited below, was grown from seeds collected in Paraguay by Archer. The corollas as said to have been "blue" on Krapovickas, Cristóbal, Arbo, Maruffak, Maruffak, & Irigoyen 17069 and on A. G. Schulz 6986 and "mauve" on Woolston 916.

Material of this species has been misidentified and distributed in some herbaria as V. bonariensis L.

Additional citations: PARAGUAY: Woolston 916 (N). ARGENTINA: Corrientes: Krapovickas, Cristóbal, Arbo, Maruffak, Maruffak, & Irigoyen 17069 (Rf). Misiones: A. G. Schulz 6986 (N). CULTIVATED: Maryland: Cowgill 903 [Pl. *Introd.* 121505] (Mi).

VERBENA PARAGUARIENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 11: 476. 1965; Moldenke, *Fifth Summ.* 1: 188 (1971) and 2: 918. 1971.

Additional citations: PARAGUAY: T. Rojas s.n. [Hassler 9751] (Ca--950435--isotype).

VERBENA PARANENSIS Moldenke

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 572. 1965; Moldenke, Phytologia 14: 292. 1967; Moldenke, Fifth Summ. 1: 178 (1971) and 2: 918. 1971.

VERBENA PARODII (Covas & Schnack) Moldenke

Additional & emended bibliography: Schnack & Covas, Darwiniana 7: [71], 72, 74, & 75, pl. 2 A & D. 1945; J. A. Clark, Card Ind. Gen. Sp. Var. issue 191. 1945; Darlington & Wylie, Chrom. Atl., pr. 1, 323. 1956; Troncoso in Cabrera, Fl. Proc. Buenos Aires 5: 134 & 139--140. 1965; Moldenke, Phytologia 16: 191. 1968; Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1238. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715. 1969; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 207. 1970; Moldenke, Fifth Summ. 1: 202 (1971) and 2: 522, 683, 688, & 918. 1971; Moldenke, Phytologia 23: 419 & 426. 1972.

Schnack & Rubens (1970) record this species from La Pampa, Argentina. Troncoso (1965) gives its distribution as "Región andina. Extremo sur de la Provincia (partidos de Patagones y Villarino)" of Buenos Aires. She cites J. H. Hunziker 384 & 4584 and Krapovickas 1990, the two former deposited in the San Isidro herbarium, the latter being sheet number 47896 in the Buenos Aires herbarium. She comments that "Los ejemplares bonaerenses difieren de la forma típica de Mendoza, en las brácteas menores (no alcanzan a veces la mitad del cáliz), tubo corolar glabro o subglabro y borde de las hojas a veces subrevoluto".

Material of this species has been misidentified and distributed in some herbaria as V. crithmifolia Gill. & Hook.

Additional citations: ARGENTINA: Mendoza: Krapovickas & Cristobal 14581 (Rf); Zöllner 5417 (Rf).

VERBENA PARVULA Hayek

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 615 & 627--628. 1960; Moldenke, Résumé Suppl. 17: 3. 1968; Moldenke, Phytologia 16: 192. 1968; Moldenke, Fifth Summ. 1: 87, 137, 144, & 184 (1971) and 2: 674 & 918. 1971; Moldenke, Phytologia 23: 222, 233, 293, 417, & 418. 1972.

Recent collectors have encountered this plant on dry or xerophytic slopes, flowering in June, fruiting in January and September. Edwin & Schuncke call it a "common roadside weed....also growing on gentler slopes", but describe it as a "shrub to 4 ft. tall", which is obviously an error in observation or transcription. The corollas are said to have been "pale-blue" on Asplund 17804 and "blue-purple" on Edwin & Schuncke V.3746. Herbarium material of V. parvula has been misidentified and distributed in some herbaria under the name V. littoralis H.B.K., while the Rose, Pachano, & Rose 22939, cited below, was previously erroneously cited by me as V. glabrata H.B.K.

Macbride (1960) comments: "A small delicate plant with the habit

of a dwarf V. officinalis L. but with completely different leaves" and cites Balls B.6784 from Cuzco, Peru. Actually, V. parvula has hardly any resemblance to V. officinalis, but does have a very close affinity with V. litoralis.

Additional citations: VENEZUELA: Mérida: López-Palacios 2552 (Ft). ECUADOR: Azuay: Asplund 17804 (N); Rose, Pachano, & Rose 22939 (N). Carchi: Sparre 14290 (S). Chimborazo: Asplund 20443 (N). Imbabura: Sparre 13582 (S). Pichincha: Sparre 13285 (S). PERU: Apurimac: Iltis & Ugent 699 (W-2558167). Arequipa: Vargas Calderón 18160 (Ac). Cajamarca: López Guillén & Chumpitáz 3393 (Rf). Lima: Riccio & Chumpitáz 3711 (Rf). Loreto: Sagástegui, Fukushima, & Vásquez 6463 (Ac). Piura: Edwin & Schuncke V. 3746 (S).

VERBENA PARVULA var. GIGAS Moldenke

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 628. 1960; Moldenke, Phytologia 13: 214. 1966; Moldenke, Fifth Summ. 1: 144 (1971) and 2: 918. 1971; Moldenke, Phytologia 23: 222 & 233. 1972.

Vargas Calderón collected this variety at 3450 m. altitude, fruiting in April. Macbride (1960) cites only the original type collection. The Field Museum photographic negative which he cites represents typical V. parvula Hayek. Vargas Calderón 19493 is a mixture with xV. dermeni Moldenke.

Additional citations: PERU: Arequipa: Vargas Calderón 19493, in part (Ac).

VERBENA PARY-CARY Fr. Allem.

Bibliography: T. Peckolt, Bericht. Deutsch. Pharm. Gesell. 14: 466. 1904; Farnsworth, Blomster, Quimby, & Schermerh., Lynn Index 6: 267. 1969; Moldenke, Fifth Summ. 2: 918 & 968. 1971.

Nothing is known to me of this plant except what is stated about it by Peckolt (1904), who says "Verbena pary-cary Fr. Allem. In den Nordstaaten vom Äquator bis zum 10.° stfdl. Br. vorkommend. Indianerbenennung: Boia-cao -- Schlangenkraut, vom Volke in Pary-cary korrumpiert; hat noch folgende Benennungen: Herva S. Pedro -- Heiliges S. Peterskraut, Menstrato -- Minze, Hortelaã brava -- wilde Minze. Dr. Castro in Pará berichtete über die arzneiliche Wirksamkeit dieser Pflanze, auch als Antidot des Schlangengebisses, zu welchem Zwecke sie vom Volke und Indianern benutzt wird. Im Archiv der Pharmacie von Dr. L. Brey, 1859, S. 42, publizierte ich den Bericht des Arztes."

The geographic limits given by Peckolt for this species would imply that it is native only to the northernmost states of Brazil, such as Amazônas, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Espirito Santo, Piauí, Alagoas, Bahia, and Goiás, but there is no species of this genus known to me with such a distribution. Possibly the plant is not even verbenaceous.

VERBENA PAULENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 10: 297--298. 1964; Angely, *Fl. Anal. Fitogeogr. Est. S. Paulo*, ed. 1, 4: 840 & xix, map 1395. 1970; Moldenke, *Fifth Summ.* 1: 178 (1971) and 2: 918. 1971.

VERBENA PAULSENI R. A. Phil.

Additional bibliography: Cabrera, *Bol. Soc. Argent. Bot.* 5: 96. 1953; Moldenke, *Phytologia* 16: 192. 1968; Moldenke, *Fifth Summ.* 1: 193 (1971) and 2: 691 & 918. 1971.

Zöllner collected this species at 800--1000 m. altitude. The corollas on Zöllner 4398 are said to have been "violet" in color when fresh.

Additional citations: CHILE: Aconcagua: Zöllner 4398 (Ac, Rf).

VERBENA PERAKII (Covas & Schnack) Moldenke

Additional & emended bibliography: Schnack & Covas, *Darwiniana* 7: [71], 72, 74, & 75, pl. 1 C & 2 B. 1945; J. A. Clark, *Card Ind. Gen. Sp. Var.* issue 191. 1945; Covas & Schnack, *Revist. Argent. Agron.* 14: 229 & 231, fig. 32. 1947; Darlington & Wylie, *Chrom. Atl.*, pr. 1, 323. 1956; Rattenbury, *Madroño* 15: 50. 1959; Moldenke, *Phytologia* 16: 192. 1968; Moldenke, *Résumé Suppl.* 16: 22. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 715 & 717. 1969; Schnack & Rubens, *Bol. Soc. Argent. Bot.* 13: 206. 1970; Moldenke, *Fifth Summ.* 1: 202 & 371 (1971) and 2: 522, 666, 667, 688, 689, 694, 700, & 918. 1971; Moldenke, *Phytologia* 23: 419 & 426. 1972.

Additional illustrations: Covas & Schnack, *Revist. Argent. Agron.* 14: 231, fig. 32. 1947.

Schnack & Rubens (1970) record this species from Catamarca and Córdoba, Argentina. Semper collected it at 700 m. altitude. The corollas on Semper 58 are said to have been "purple".

Additional citations: ARGENTINA: Mendoza: Semper 58 (N).

VERBENA PERENNIS Wooton

Additional synonymy: Verbena perenais Wooton ex Moldenke, *Fifth Summ.* 2: 689, in syn. 1971.

Additional & emended bibliography: Howell & McClintock in Kearney & Peebles, *Ariz. Fl.*, ed. 2, 726 & 728. 1960; Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 19. 1961; Rattenbury, *Madroño* 16: 267. 1962; Hocking, *Excerpt. Bot. A.6*: 91. 1963; Moldenke, *Phytologia* 16: 192. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 717. 1969; Rickett, *Wild Fls. U. S.* 3 (2): 365 (1969) and 4 (3): 540 & 799. 1970; Moldenke in Correll & Johnston, *Man. Vasc. Pl. Tex.* [Contrib. Tex. Res. Found. Bot. 6:] 1314 & 1321. 1970; Correll & Johnston, *Man. Vasc. Pl. Tex.* [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Moldenke, *Fifth Summ.* 1: 59, 62, 63, 76, & 400 (1971) and 2: 689 & 918. 1971; Mahler, *Key Vasc. Pl. Black Gap*, ed. 3, 70. 1971; Moldenke, *Phytologia* 23: 242 & 374. 1972.

Emended illustrations: Lewis & Oliv., Am. Journ. Bot. 48: 640, fig. 19. 1961.

Recent collectors refer to this plant as globose, 25 cm. tall, from a thick, woody, perennial taproot, with showy very odoriferous flowers, the lower lip of the corolla being undulate-margined. The corollas are described as "bright blue-violet" on Solbrig 3186, "purple" on Latorre s.n., "blue-lavender" on Whitehouse 17019, "lavender" on D. S. Correll 34066, and "blue to purple" on C. H. Muller 8214. In addition to the months previously reported, this plant has been collected in fruit in September. It has been found growing among rocky ledges of pinyon pine-juniper associations, while Correll encountered it "on hills formed by tilted shales" and describes it as a "sprawling shrub to 1 foot tall".

Mahler (1971) records the common names "perennial verbena" and "pinleaf vervain".

The haploid chromosome number for the species is confirmed as 7 by Rattenbury (1962), based on Solbrig 3186 from Pecos County, Texas. Howell & McClintock (1960) cite only M. E. Jones 24994.

Additional citations: TEXAS: Brewster Co.: D. S. Correll 34066 (Ld); Warnock 21827 (Se--159659). Culberson Co.: Mahler 838 (Au--248888); Matthews & Matthews 310 (Au--259930); Whitehouse 17019 (N). Hudspeth Co.: C. H. Muller 8214 (Mi). Pecos Co.: C. M. Rowell 11147 (Lk); Solbrig 3186 (W--2607469). NEW MEXICO: Lincoln Co.: E. L. Reed 3655 (Lk, Lk, Lk). MEXICO: Coahuila: Latorre s.n. [12 May 1968] (Au--265091); E. G. Marsh 859 (Au--212686).

VERBENA PERENNIS var. JOHNSTONI Moldenke

Additional bibliography: Moldenke, *Phytologia* 16: 192. 1968; Moldenke, *Fifth Summ.* 1: 76 (1971) and 2: 695 & 913. 1971.

The variety has been collected in flower and fruit in May (in addition to the months previously reported by me).

Additional citations: MEXICO: Nuevo León: H. Hernández s.n. [18/V/1965] (Z).

xVERBENA PERPLEXA Moldenke

Additional bibliography: Moldenke, *Phytologia* 10: 306--307. 1964; G. Taylor, *Ind. Kew. Suppl.* 14: 142. 1970; Moldenke, *Fifth Summ.* 1: 63 (1971) and 2: 654, 671, & 913. 1971; Moldenke, *Phytologia* 22: 471. 1972.

xVERBENA PERRIANA Moldenke

Additional bibliography: Moldenke, *Phytologia* 16: 192. 1968; Moldenke, *Résumé Suppl.* 16: 2 (1968) and 17: [1]. 1968; Moldenke, *Fifth Summ.* 1: 15, 27, 32, 35--38, 41, 44, 45, 47, 52, 53, & 64 (1971) and 2: 525, 656, 657, 672, 678, 686, 698, 704, 705, & 913. 1971; Moldenke, *Phytologia* 23: 222, 223, & 265. 1972.

Material of this hybrid has been misidentified and distributed in some herbaria as V. urticifolia L.

Additional citations: ILLINOIS: Cass Co.: Geyer s.n. [Beards-

town, July 1842] (Ws--cotype). Henderson Co.: H. N. Patterson s.n. [Oquawka, July] (Pa). Peoria Co.: J. T. Stewart 13861 (Ws). Winnebago Co.: M. S. Bebb s.n. [Fountaindale, 1871] (Pa). WISCONSIN: Sauk Co.: T. J. Hale s.n. [Baraboo, 1861] (Pa, W--2606306). MISSOURI: Saint Louis: Eggert s.n. [Prairies, 11 August 1891] (Pa); Engelmann s.n. [St. Louis, July 1842] (Ws--cotype). NEBRASKA: Kearney Co.: Hapeman s.n. [Minden, Aug. 23, 1939] (Se--170256).

xVERBENA PERTURBATA Moldenke

Additional bibliography: Moldenke, *Phytologia* 16: 193. 1968; G. Taylor, *Ind. Kew. Suppl.* 14: 142. 1970; Moldenke, *Fifth Summ.* 1: 202 (1971) and 2: 522, 683, 688, & 918. 1971.

VERBENA PERUVIANA (L.) Britton

Additional synonymy: Glandularia peruviana Small apud J. A. Clark, *Card Ind. Gen. Sp. Var. issue* 141. 1933. Erimus peruvianus L. apud Angely, *Fl. Anal. Fitogeogr. Est. S. Paulo*, ed. 1, 4: 840, in syn. 1970. Verbena peruviana Moldenke ex Angely, *Fl. Anal. Fitogeogr. Est. S. Paulo*, ed. 1, 4: 840, sphalm. 1970. Glandularia peruviana (L.) Britton ex Moldenke, *Fifth Summ.* 2: 522, in syn. 1971.

Additional & emended bibliography: Pers., *Sp. Pl.* 3: 346--347. 1819; Steud., *Nom. Bot. Phan.*, ed. 1, 873. 1821; Voigt, *Hort. Suburb. Calc.* 472. 1845; E. Twining, *Ill. Nat. Ord. Pl.* 2: 104, fig. 2. 1855; A. Wood, *Class-book*, [ed. 42], pr. 1, 538. 1861; A. Gray, *Man. Bot.*, ed. 3, lxvi (1862) and ed. 4, pr. 1, lxvi. 1863; A. Wood, *Class-book*, [ed. 42], pr. 2, 538. 1863; A. Gray, *Man. Bot.*, ed. 4, pr. 2, lxvi. 1864; A. Wood, *Class-book*, [ed. 42], pr. 3, 538 (1865), [ed. 42], pr. 4, 538 (1867), and [ed. 42], pr. 5, 538. 1868; A. Gray, *Field For. & Gard. Bot.*, ed. 1, pr. 1, 242 (1868) and ed. 1, pr. 2, 242. 1869; A. Wood, *Class-book*, [ed. 42], pr. 6, 538 (1869) and [ed. 42], pr. 7, 538. 1870; A. Wood, *Am. Bot. & Flor.*, ed. 1, pr. 1, 236 (1870), ed. 1, pr. 2, 236 (1871), and ed. 1, pr. 3, 236. 1872; A. Wood, *Class-book*, [ed. 42], pr. 8, 538. 1872; A. Wood, *Am. Bot. & Flor.*, ed. 1, pr. 4, 236 (1873), ed. 1, pr. 5, 236 (1874), and ed. 1, pr. 6, 236. 1875; A. Wood, *Class-book*, [ed. 42], pr. 9, 538. 1876; A. Gray, *Field For. & Gard. Bot.*, ed. 1, pr. 3, 242. 1880; A. Wood, *Class-book*, [ed. 42], pr. 10, 538. 1881; Vesque, *Ann. Sci. Nat. Paris.*, sér. 7, 1: 339. 1885; O. R. Willis in A. Wood, *Am. Bot. & Flor.*, ed. 2, 236. 1889; L. H. Bailey in A. Gray, *Field For. & Gard. Bot.*, ed. 2, 341. 1895; Sanders, *Encycl. Gard.*, ed. 2, 409. 1897; T. Peckolt, *Bericht. Deutsch. Pharm. Gesel.* 14: 465. 1904; Baez, *Anal. Assoc. Estud. Mus. Pop. Paraná* 1920: 37. 1920; Lázaro e Ibiza, *Comp. Fl. España.*, ed. 3, 3: 297. 1921; Macself in Sanders, *Encycl. Gard.*, ed. 21, pr. 1, 457. 1931; J. A. Clark, *Card Ind. Gen. Sp. Var. issue* 141. 1933; Macself in Sanders, *Encycl. Gard.*, ed. 21, pr. 2, 457. 1934; Navarro de Haydon, *Flor. Comun. Puerto Rico* [16]. 1936; Baez, *Mus. Entre Ríos Cart. Herb. Paran.* 43. 1938; Macself in Sanders, *Encycl. Gard.*, ed. 21,

pr. 3, 457 (1938), ed. 21, pr. 4, 457 (1942), and ed. 21, pr. 5, 457. 1945; Schnack & Covas, *Darwiniana* 7: [71]--75, pl. 3 B, C, & F & 4 A. 1945; Schnack & Covas, *Revist. Argent. Agron.* 12: 224--228, fig. 1 A, 2 A--C, 3 A--C, & pl. 11 & 12 B, C, & F. 1945; Macself in Sanders, *Encycl. Gard.*, ed. 21, pr. 6, 457. 1946; E. L. Palmer, *Fieldbook Nat. Hist.*, ed. 1, pr. 3, 297 & 663. 1949; Hellyer in Sanders, *Encycl. Gard.*, ed. 22, pr. 1, 457 (1950) and ed. 22, pr. 2, 507. 1952; Cabrera, *Man. Fl. Alred. Buenos Aires* 397. 1953; Schnack & Solbrig, *Revist. Fac. Agr. La Plata* 29: [255]--266, fig. 1 C--E, 3 A & B, & 4 C & H. 1953; Hellyer in Sanders, *Encycl. Gard.*, ed. 22, pr. 3, 507. 1956; Schnack, Fehleisen, & Cocucci, *Revist. Argent. Agron.* 24: 129 & 132--135, pl. 1 C, D, & G. 1957; J. F. Macbr., *Field Mus. Publ. Bot.* 13 (5): 614. 1960; Balakrishnan, *Bull. Bot. Surv. India* 6: 87. 1964; Martínez-Crovetto, *Bonplandia* 1: 287, 299, 301, & 314. 1964; Melchior in Engl., *Syllab. Pflanzenfam.*, ed. 12, 2: 436, fig. 184 F & L. 1964; Angely, *Fl. Anal. Paran.*, ed. 1, 572. 1965; Hocking, *Excerpt. Bot. A.9*: 365 & 366. 1965; Martínez-Crovetto, *Bonplandia* 2: 6 & 19. 1965; Troncoso in Cabrera, *Fl. Prov. Buenos Aires* 133. 1965; Yotaro, *Gard. Pl. World* 1: 131, pl. 66, fig. 2. 1965; Burkill, *Dict. Econ. Prod. Malay Penins.* 2: 2266. 1966; Greensill, *Trop. Gardening* 79. 1966; Hirata, *Host Range & Geogr. Distrib. Powd. Mild.* 276. 1966; G. Abraham, *Green Thumb Book* 188. 1967; D'Arcy, *Rhodora* 69: 439. 1967; Zukowski in Pawlowskiego, *Fl. Polsk.* 11: 65. 1967; Moldenke, *Phytologia* 16: 193--194 & 212. 1968; Moldenke, *Résumé Suppl.* 16: 7, 13, 22, & 28 (1968) and 17: 7. 1968; Solbrig, Passani, & Glass, *Am. Journ. Bot.* 55: 1235--1239. 1968; Stucchi, *Fiori* 11: 136. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 715--717. 1969; R. F. V. Cooper in Pastore, *Bol. Soc. Argent. Hort.* 157: 125. 1969; Hay & Synge, *Dict. Gard. Pl.* 177 & 369, pl. 1411. 1969; Raman, *Curr. Sci.* 38: [579]. 1969; Solbrig, Passani, & Glass, *Biol. Abstr.* 50: 4151. 1969; Swink, *Fl. Chicago Reg.* 428. 1969; Angely, *Fl. Anal. Fitogeogr. Est. S. Paulo*, ed. 1, 4: 840 & xix. 1970; Graf, *Exot. Pl. Man.*, ed. 1, 410. 1970; Moldenke in Menninger, *Flow. Vines* 338--339. 1970; Montgomery & Cheo, *Lasca Leaves* 20 (3): 58. 1970; Schnack & Rubens, *Bol. Soc. Argent. Bot.* 13: 205 & 208. 1970; Solbrig, *Princ. & Meth. Pl. Biosystem.* 75, 76, 148, 150, 157, & 158, fig. 5-1 & 9-5. 1970; Moldenke, *Phytologia* 22: 471 (1972) and 23: 193, 194, 226, 227, 273, 278, 279, 426, 427, 430, 431, & 436. 1972; A. L. Moldenke, *Phytologia* 23: 318, 372, & 373. 1972.

Additional & emended illustrations: Schnack & Covas, *Darwiniana* 7: pl. 3 B, C, & F & 4 A. 1945; Schnack & Covas, *Revist. Argent. Agron.* 12: 225, fig. 1 A, 226, fig. 2 A--C, 227, fig. A--C, & pl. 11 & 12 B, C, & F. 1945; Schnack & Solbrig, *Revist. Fac. Agr. La Plata* 29: 257, 261, & 263, fig. 1 C--E, 3 A & B, & 4 C & H. 1953; Schnack, Fehleisen, & Cocucci, *Revist. Argent. Agron.* 24: 133, pl. 1 C, D, & G. 1957; Melchior in Engl., *Syllab. Pflanzenfam.*, ed. 12, 2: 436, fig. 184 F & L. 1964; Yotaro, *Gard. Pl. World* 1: pl. 66, fig. 2 [in color]. 1965; Hay & Synge, *Dict. Gard. Pl.* 177, pl. 1411 [in color]. 1969; Solbrig, *Princ. & Meth. Biosystem.* 76, fig. 5-1. 1970.

Recent collectors have found this plant growing on campos. The corollas are described as having been "red" on Abbiatti 4027, Cabrera & Fabris 14743, Job 2949, Ruíz Huidobro 1225 & 1538, and Varela 614, "scarlet" on W. R. Sykes 1044/64, and "bright scarlet" by Hay & Synge (1969). The last-mentioned authors describe the leaves as oblong, gray-green and the flowers borne in dense clusters, 4--6 inches long. They recommend V. peruviana for "well-drained soil and a sheltered sunny corner. Not reliably hardy and best raised from cuttings each year in 8--9 [=August-September] of the current growth and inserted in sandy soil. Overwinter in a frost-free greenhouse and plant out in 5--6 [=May-June]." Greensill (1966) points out that it has "daintier foliage than the annual plant" [by which he presumably means xV. hybrida Voss].

Vernacular names in addition to those reported previously by me include "jurujúba", "melindres colorado", "pampas", "Peruvian vervain", "rojo-punzé", and "verbena melindres".

Abraham (1967) asserts that V. peruviana is good for use in hanging baskets, but its leaves will turn brown if the soil becomes dry. Martínez-Crovetto (1964, 1965) records the Chaco Amerind names "bashé umpatpát (=pegado a la tierra)", "adagn(a)rát l(o)kó", "aragn(a)rát l(o)ko (comido de víbora)", "pôkô (brasa, carbón encendido)", and "tok lauró" (flor roja) -- "pôkô" being also applied to Urtica urens by them and "tok lauró" to Dolichandra cynanchoides and Portulaca grandiflora. He tells us that they use the plant "para el 'dolor de vista' y contra los dolores de barriga".

Bolkhovskikh and his associates (1969) point out that the haploid number of chromosomes for V. peruviana was given by Junell (1934), Beale (1940), Schnack & Covas (1945), and Schnack & Solbrig as 10, but as 15 by Schnack, Fehleisen, & Cocucci (1957). Possibly some misidentifications of the material examined are involved here, since the name, V. peruviana, has often been applied haphazardly to any red-flowered species.

Solbrig and his associates (1968) report a hybrid between V. peruviana and V. elegans H.B.K., but fail to describe or name it or to cite any substantiating specimens from which its morphological characters could be obtained. Likewise, Solbrig (1970) refers to a hybrid with V. moricolor Moldenke and another with what he calls V. pulchella Sweet, but which probably is not V. pulchella in the sense that this binomial is interpreted by me.

Swink (1969) makes the claim that "According to Moldenke (Phytologia 10: 406, 1964), the legitimate name of this plant may well be Verbena chamaedryfolia". This is hardly true because Feuillée's original specimen, on which Erinus peruvianus L. is based, is also the basis of Jussieu's Verbena chamaedryfolia. Feuillée's plant may very possibly be some other species than the one now passing as V. peruviana. However, Macbride (1960) maintains that Feuillée's type came from Paraguay and this seems to be

correct: "Type from Paraguay!; based on a plant of Abbé Feuillé, Per. 3: 36, pl. 25. 1725, as noted by Briquet, Ann. Cons. Jard. Bot. Genève 7: 290. 1904; as he pointed out, Britton's transfer (now acceptable) was prompted on the basis of a misdetermination and the plant of Jussieu, as that of Linnaeus, is unknown in Peru unless in cultivation. Flowers brilliant scarlet."

Lázaro e Ibiza (1921) describes the plant as "Tallo erizado; hojas ovales, con pecíolo corto, festonado-dentadas o hendidas, ásperas; espigas solitarias; brácteas lanceolado-alesnadas, mitad que el cáliz; corola grande y roja. Fl. verano". Peckolt (1904) says of the distribution of the species in Brazil: "In den Südstaaten heimisch; wird zufolge ihrer scharlachroten Blüten in allen Gärten kultiviert". Balakrishnan (1964) records it as cultivated in India. Stucchi (1968) avers that it was introduced into Italy between 1829 and 1839. Montgomery & Cheo (1970) report drought tolerance very good for V. peruviana, that it is hardy to cold below 20° F., shows good erosion control at 9--30° grade, and has medium-low maintenance requirements.

It should be noted here that the figure given by Melchior (1964) is erroneously referred to as "E" in the legend instead of "F"; the illustration given by Graf (1970) as "Verbena peruviana 'Chiquita'" is actually V. tenera var. maonetti Regel! The Aguilar 55, Fabris 4958, Rocha 3683, and Woolston 731 & 1353, distributed as V. peruviana, are all actually V. incisa Hook., while Venturi 378b is Phyla nodiflora var. reptans (Spreng.) Moldenke.

Troncoso (1965) cites Abbiatti 4057, Rentzell s.n., and Valencia s.n. from Buenos Aires, Argentina.

Additional citations: BRAZIL: Rio Grande do Sul: Palacios & Cuezco 1763 (N), 2080 (N). PARAGUAY: Lourteig 2030 (S). URUGUAY: Rosengurtt & Gallinal 5694 (Se--126901). ARGENTINA: Buenos Aires: Abbiatti 4027 (N); Cabrera & Fabris 14743 (N); Fabris & Cullen 2506 (Ip); Ruiz Huidobro 1225 (N), 1307 (N), 1358 (N), 1538 (N). Catamarca: O'Donell & Meyer 5247 (N); Pierotti 11526 [Herb. Inst. Miguel Lillo 28352] (N). Córdoba: Ledingham 4469 (Sk); Nicora 873 (W--2567985). Corrientes: G. J. Schwarz 182 (N). Entre Ríos: Job s.n. [Yuquerí chico, 3/XI/1949] (N). Jujuy: Garolera & Romero s.n. [11-I-1947] (N). La Pampa: Fortuna 12 (N). La Rioja: Job 2949 (N). Misiones: Ibarrola 1120 (N); G. J. Schwarz 4735 (N). San Luis: Varela 614 (N). Santiago del Estero: P. García 892 (N). Tucumán: M. R. Malvarez 69 (N). CULTIVATED: New Zealand: W. R. Sykes 1044/64 [Herb. Bot. Div. D. S. I. R. 153296] (Rf).

VERBENA PERUVIANA (L.) Britton x V. ELEGANS H.B.K.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Solbrig, Princ. & Meth. Biosystem. 148. 1970; Moldenke, Fifth Summ. 370, 914, & 970. 1971; Moldenke, Phytologia 23:

227, 426, & 431. 1972.

Solbrig and his associates (1968, 1969, 1970) speak of the crosses which they have made between these two species, producing a tetraploid hybrid which showed less than 5 percent fertility and a segmental allooctoploid hybrid which showed over 70 percent fertility. A binomial designation has not yet been proposed for these hybrids because the accuracy of identification of the purported parents has not been verified.

VERBENA PERUVIANA (L.) Britton x V. MORICOLOR Moldenke, Fifth Summ. 2: 918 & 970. 1971.

Bibliography: Solbrig, Princ. & Meth. Pl. Biosystem. 76. 1970; Moldenke, Fifth Summ. 2: 918 & 970. 1971; Moldenke, Phytologia 23: 427. 1972.

See under V. moricolor x peruviana in this series of notes for Solbrig's discussion of this hybrid.

VERBENA PERUVIANA (L.) Britton x V. PULCHELLA Sweet ex Moldenke, Fifth Summ. 2: 918 & 970. 1971.

Synonymy: Glandularia pulchella x peruviana Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1238. 1968; Solbrig, Princ. & Meth. Pl. Biosystem. 75 & 148. 1970; Moldenke, Fifth Summ. 2: 918 & 970. 1971; Moldenke, Phytologia 23: 427 & 431. 1972.

Solbrig (1970) asserts that this is a natural hybrid, but rarely seen in the field. He has produced it artificially and describes its chromosomal picture: "When they were obtained artificially in the experimental garden they were approximately 40--50% pollen fertile, and only about 1% of the flowers set seed". The hybrid plant itself is not described nor are any collections cited. I am not sure that his interpretation of one or even both of the supposed parental species is the same as mine, and so I am not assigning a hybrid name as yet. Examination of herbarium vouchers, if any, of the parental species and of the hybrid is much to be desired.

VERBENA PERUVIANA f. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 14: 293. 1967; Moldenke, Fifth Summ. 1: 178 (1971) and 2: 918. 1971.

VERBENA PERUVIANA var. GLABRIUSCULA Kuntze

Additional bibliography: Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 134. 1965; Moldenke, Phytologia 14: 293. 1967; Moldenke, Fifth Summ. 1: 190, 202, & 371 (1971) and 2: 918. 1971.

Troncoso (1965) reduces this variety to synonymy under typical V. peruviana (L.) Britton, but its almost smooth leaves distinguish it quite well, at least in my estimation.

VERBENA PERUVIANA f. ROSEA Moldenke

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (5): 628. 1960; Moldenke, Phytologia 10: 491--492. 1964; Moldenke, Fifth Summ. 1: 178, 190, & 372 (1971) and 2: 662, 689, & 918. 1971.

Macbride (1960) implies that this form is to be expected in Peru, but presumably only in cultivation, since he states that the typical form of the species occurs there only in that state. No supporting specimens are cited for either taxon.

VERBENA PHLOGIFLORA Cham.

Additional & emended synonymy: Glandularia phlogiflora (Cham.) Schnack & Covas apud J. A. Clark, Card Ind. Gen. Sp. Var. issue 183. 1944. Verbena phlogiflora Cham. emend. Mold. apud Troncoso, Darwiniana 1: 616, in syn. 1971. Verbena megapotamica var. phlogiflora Cham. apud Troncoso, Darwiniana 1: 616, in syn. 1971.

Additional & emended bibliography: A. Gray, Man. Bot., ed. 3, lxvi (1862), ed. 4, pr. 1, lxvi (1863), and ed. 4, pr. 2, lxvi, 1864; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 242 (1868) and ed. 1, pr. 2, 242. 1869; A. Wood, Am. Bot. & Flor., ed. 1, pr. 1, 236 (1870), ed. 1, pr. 2, 236 (1871), ed. 1, pr. 3, 236 (1872), ed. 1, pr. 4, 236 (1873), ed. 1, pr. 5, 236 (1874), and ed. 1, pr. 6, 236. 1875; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 3, 242. 1880; O. R. Willis in A. Wood, Am. Bot. & Flor., ed. 2, 236. 1889; L. H. Bailey in A. Gray, Field For. & Gard. Bot., ed. 2, 341. 1895; Sanders, Encycl. Gard., ed. 2, 409. 1897; Schnack & Covas, Darwiniana 7: [71]--75, pl. 3 E & 4 D. 1945; Darlington & Wylie, Chrom. Atl., pr. 1, 323. 1956; Angely, Fl. Anal. Paran., ed. 1, 573. 1965; Yotaro, Gard. Pl. World 1: 131. 1965; Burkill, Dict. Econ. Prod. Malay Penins. 2: 2266. 1966; Moldenke, Phytologia 16: 194--196. 1968; Moldenke, Résumé Suppl. 16: 13 & 28. 1968; Stucchi, Fiori 11: 131. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715 & 717. 1969; Angely, Fl. Anal. Fito-geogr. Est. S. Paulo, ed. 1, 4: 840 & xiv, map 1395. 1970; Moldenke in Menninger, Flow. Vines 339. 1970; Troncoso, Darwiniana 16: [613], 614, 616--618, & 621, fig. 2. 1971; Moldenke, Fifth Summ. 1: 98, 178, 188, 190, 202, & 372 (1971) and 2: 521, 522, 657, 665, 683, 685, 689, 690, 700, 703, 709, 783, & 918. 1971; Moldenke, Phytologia 23: 193, 194, 239, 300, 427, & 436. 1972.

Additional & emended illustrations: Schnack & Covas, Darwiniana 7: pl. 4 D. 1945; Troncoso, Darwiniana 16: 617, fig. 2. 1971.

The corollas of this species are described as having been "lilac" on Hatschbach 14967 and Rodriguez V. 566, "violet" on Hatschbach 15522, and "clear violet" on Hatschbach 15008. The chromosome number is given as $2n = 10$ by Junell (1934) and by Schnack & Covas (1945). Stucchi (1968) tells us that it was introduced into Italy between 1827 and 1837. Sasaki (1928) lists it as cultivated on Formosa and cites the vernacular names "bizo-zakura", "hana-gasa", and "siki-zakura", but it seems most probable that the plant to which he refers is xv. hybrida Voss. Troncoso (1971) gives the overall distribution of V. phlogiflora as "Sur del Bra-

sil y NE argentino, en Misiones. Ruderal, en matorrales y capu-
 eras". She comments that "Chamisso al describir su var. ♂ señala
 que las espigas son algo alargadas después de la antesis. Este
 carácter no se ha podido confirmar, por el contrario en todos los
 ejemplares fructificados revisados, las inflorescencias son glo-
 bosas y no se alargan.....El área más austral de G. phlogiflora
 es la provincia de Misiones y muy probable la de Corrientes, en
 la Argentina. Las citas de Moldenke.....para la provincia de
 Buenos Aires, deben referirse a G. megapotamica."

The Foust s.n. [10/25/1937], distributed as V. phlogiflora, is
 actually V. canadensis (L.) Britton, while H. Evans s.n. [Santa
 Monica] and Kansiro 5828 are V. rigida Spreng.

An unnamed hybrid between V. phlogiflora and V. santiaguensis
 (Covas & Schnack) Moldenke is referred to by Schnack & Covas in
 Darwiniana 7: 73 & 75 (1945).

Troncoso (1971) cites the following: BRAZIL: Paraná: Hatsch-
 bach 15041, 15522, & 22637. Santa Catarina: Klein 4406 & 4881;
Reitz 3404; Smith & Klein 13223. State undetermined: Sellow s.n.
 ARGENTINA: Misiones: Martínez Crovetto G. 361; Schnack s.n. [Herb.
 San Isidro 26407].

Additional citations: BRAZIL: Paraná: Hatschbach 14967 (W--
 2563949), 15008 (W--2564698), 15522 (W--2564731); Hatschbach,
Lindeman, & Haas 13747 (Ac); Reitz & Klein 17786 (N, W--2548335).
 Santa Catarina: Smith & Klein 13223 (N). ARGENTINA: Buenos Aires:
Rodríguez V. 566 (N). Corrientes: Ruiz Huidobro 4408 (Se--130306).
 Misiones: Pierotti 6599 (N); G. J. Schwarz 610 (N), 4772 (N).

VERBENA PHLOGIFLORA f. ALBA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 216. 1966;
 Moldenke, Fifth Summ. 1: 178 (1971) and 2: 918. 1971.

VERBENA PINETORUM Moldenke

Additional bibliography: Howell & McClintock in Kearney & Peeb-
 les, Ariz. Fl., ed. 2, 726 & 728. 1960; Rickett, Wild Fls. U. S.
 4. (3): 540 & 799. 1970; Moldenke, Fifth Summ. 1: 63 & 76 (1971)
 and 2: 918. 1971; Moldenke, Phytologia 22: 499 (1972) and 23: 184,
 302, & 374. 1972.

Pennington reports that in Sonora a medicinal tea is made by
 boiling the entire plant of this species and that it is taken
 against fevers. Howell & McClintock (1960) cite Berry s.n. [Santa
 Rita Mtns., 1904]. Pennington 215 is a mixture with V. carolina
 L., while Pennington 43, 66, & 98, distributed as V. pinetorum, are
 apparently V. menthaefolia Benth.

Additional citations: MEXICO: México: Paxson & Barkley 16M839
 (Au--121975). Sonora: Pennington 74 (Au--264095), 215, in part
 (Au--264202).

VERBENA PINNATILOBA (Kuntze) Moldenke

Additional synonymy: Glandularia pinnatiloba Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 205. 1970.

Additional bibliography: Moldenke, Phytologia 11: 477. 1965; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 205. 1970; Moldenke, Fifth Summ. 1: 188, 190, & 202 (1971) and 2: 683 & 918. 1971; Moldenke, Phytologia 23: 431. 1972.

Burkart refers to this species as abundant in abandoned campos bordering quebrachal. Krapovickas and his associates found it growing along roadsides. It has been collected in anthesis and fruit in October and November (in addition to the months previously reported by me). The corollas on Burkart 19550 and on Krapovickas, Cristóbal, Arbo, Maruñak, Maruñak, & Irigoyen 16725 are said to have been "violet", on R. M. Aguilar 1070 they were "red", and on Krapovickas & Cristóbal 16373 they were "lilac".

Additional citations: ARGENTINA: Chaco: R. M. Aguilar 1070 (N). Corrientes: Burkart 19550 (W--2567975); Krapovickas & Cristóbal 16373 (Z); Krapovickas, Cristóbal, Arbo, Maruñak, Maruñak, & Irigoyen 16725 (Rf). Misiones: G. J. Schwarz 4847 (N).

VERBENA PLATENSIS Spreng.

Additional & emended bibliography: A. Gray, Man. Bot., ed. 3, lxvi (1862), ed. 4, pr. 1, lxvi (1863), and ed. 4, pr. 2, lxvi. 1864; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 242 (1868) and ed. 1, pr. 2, 242. 1869; A. Wood, Am. Bot. & Flor., ed. 1, pr. 1, 236 (1870), ed. 1, pr. 2, 236 (1871), ed. 1, pr. 3, 236 (1872), ed. 1, pr. 4, 236 (1873), ed. 1, pr. 5, 236 (1874), and ed. 1, pr. 6, 236. 1875; A. Gray, Field For. & Gard. Bot., ed. 1, pr. 3, 242. 1880; O. R. Willis in A. Wood, Am. Bot. & Flor., ed. 2, 236. 1889; L. H. Bailey in A. Gray, Field For. & Gard. Bot., ed. 2, 341. 1895; Sanders, Encycl. Gard., ed. 2, 409. 1897; Reiche & Phil., Fl. Chil. 5: 295. 1910; Baez, Anal. Asoc. Estud. Mus. Pop. Paraná 1920: 37. 1920; Sanders, Encycl. Gard., ed. 19, 447. 1930; Macself in Sanders, Encycl. Gard., ed. 21, pr. 1, 456 (1931) and ed. 21, pr. 2, 456. 1934; Cheymol, Bull. Soc. Chim. Biol. 19: 1647--1653. 1937; Noack, Biol. Zentralbl. 57: [383], 384, & 387, fig. 16. 1937; Anon., Chem. Abstr. 32: 2977. 1938; Baez, Mus. Entre Rios Cart. Herb. Paran. 43. 1938; Macself in Sanders, Encycl. Gard., ed. 21, pr. 3, 456. 1938; L. V. Barton, Contrib. Boyce Thomp. Inst. 10: 399, 401, 410, 411, 425, & 525. 1939; Macself in Sanders, Encycl. Gard., ed. 21, pr. 4, 456. 1942; J. A. Clark, Card Ind. Gen. Sp. Var. issue 183. 1944; Schnack & Covas, Darwiniana 7: [71] & 72. 1945; Macself in Sanders, Encycl. Gard., ed. 21, pr. 5, 456 (1945) and ed. 21, pr. 6, 456. 1946; Hellyer in Sanders, Encycl. Gard., ed. 22, pr. 1, 456 (1950) and ed. 22, pr. 2, 506 & 507. 1952; L. V. Barton, Contrib. Boyce Thomp. Inst. 17: 87. 1953; Cabrera, Man. Fl. Alred. Buenos Aires 397 & 398. 1953; Hellyer in Sanders, Encycl. Gard., ed. 22, pr. 3, 506 & 507. 1956; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 133, 135, & 136, fig. 46 E--G. 1965; Altman & Dittmer, Environ. Biol. 55, 624, & 641. 1966; Burkill, Dict. Econ. Prod. Malay Penins. 2: 2266. 1966; Hirata, Host Range & Geogr. Distrib.

Powd. Mild. 277. 1966; Thornberry, U. S. Dept. Agr. Agric. Handb. 165: 479. 1966; Moldenke, Phytologia 16: 195. 1968; Moldenke, Résumé Suppl. 16: 13 & 28. 1968; Stucchi, Fiori 11: 131. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 715 & 717. 1969; Coats, Pl. Hunters 359. 1969; Farnsworth, Blomster, Quimby, & Schermerh., Lynn Index 6: 267. 1969; El-Gazzar & Wats., New Phytol. 69: 483 & 485. 1970; Gibson, Fieldiana Bot. 24 (9): 230. 1970; Moldenke in Menninger, Flow. Vines 339. 1970; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 207. 1970; Moldenke, Fifth Summ. 1: 178, 188, 190, 193, 202, 203, & 372 (1971) and 2: 522, 659, 662, 685, 688-691, 693, 695, 699, 700, 702, 783, 789, & 918. 1971; Moldenke, Phytologia 22: 471 (1972) and 23: 278 & 427. 1972.

Additional illustrations: Noack, Biol. Zentralbl. 57: 387, fig. 16. 1937; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 136, fig. 46 E-G. 1965.

Recent collectors have found this species in fruit from November to January. The corollas are described as having been "white" on Cabrera, Arambarri, Cabrera, & Malcalza 12726 and on Ruiz Huidobro 1175, 1281, 1575, & 1699. The leaves are rather narrow on Golbach 120. The chromosome number for the species is given as $2n = 10$ by Dermen (1936), Noack (1937), and Schnack & Covas (1945). Verbenaloides is reported as present in this species by Cheymol (1937).

Troncoso (1965) gives the overall geographic distribution of V. platensis as "Sur del Brasil, Paraguay, Uruguay y Argentina. Habita en la estepa virgen y en las lomas pedregosas de las sierras del sur de la Provincia [Buenos Aires], poco común en las barrancas del Paraná y del Plata". She cites from Buenos Aires only Burkart 4797, Cabrera 6570, and Hicken s.n. [San Isidro herb. no. 3440]. Schnack & Rubens (1970) record it from La Pampa. Gibson (1970) says that it is cultivated in Guatemala, but this report may be based on a misidentification of a white race of xV. hybrida Voss.

Coats (1969) notes that "Tweedie in 1837 at Sierra de Tandil, about 300 miles inland from Buenos Aires, collected seeds of Verbena platensis (=teucroides)" in a very barren area. This probably represented the original source of its introduction into cultivation and subsequent use in the hybridization leading to xV. hybrida Voss. Stucchi (1968) bears this out by his assertion that V. platensis was introduced into Italy between 1829 and 1839. Hirata (1966) records the fungus, Oidium verbenae, as attacking this species in Russian gardens.

The Molina R. 14708, distributed as V. platensis, is actually xV. hybrida Voss.

Additional citations: ARGENTINA: Buenos Aires: Burkart 25641 (W-2567994); Fabris & Schwabe 4717 (N); Guitman s.n. [Pan de Azúcar, 4-X-1956] (N); Ruiz Huidobro 1175 (N), 1281 (N), 1575 (N), 1699 (N, N). Catamarca: Cristóbal 462 (Ca-1181621). Jujuy: Cabrera, Arambarri, Cabrera, & Malcalza 12726 (Ip). La Pampa:

Troncoso s.n. [Herb. Inst. Bot. Farw. 20587] (W--2567988). San Luis: Varela 651 (N). Tucumán: Golbach 120 (N).

VERBENA PLATENSIS var. STENODES Briq.

Additional bibliography: Moldenke, Phytologia 16: 195. 1968; Moldenke, Fifth Summ. 1: 188 & 202 (1971) and 2: 662 & 918. 1971.

Additional citations: ARGENTINA: Salta: Garolera & Romero s.n. [16-I-1947] (Se--129883).

VERBENA PLATENSIS f. VIOLACEA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 477. 1965; Moldenke, Fifth Summ. 1: 190 (1971) and 2: 918. 1971.

VERBENA PLICATA Greene

Additional synonymy: Verbena plecata Greene ex Moldenke, Fifth Summ. 2: 690, in syn. 1971. Verbena plicata stricta Rowell ex Moldenke, Fifth Summ. 2: 690, in syn. 1971. Verbena plicata var. plicata Devor ex Moldenke, Phytologia 23: 436, in syn. 1972.

Additional & emended bibliography: Howell & McClintock in Kearney & Peebles, Ariz. Fl., ed. 2, 726 & 728. 1960; Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 20. 1961; Rattenbury, Madroño 16: 267. 1962; Hocking, Excerpt. Bot. A.6: 91 (1963) and A.9: 365 & 366. 1965; Moldenke, Phytologia 16: 195--196. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 717. 1969; Rickett, Wild Fls. U. S. 3 (2): 365 (1969) and 4 (3): 540 & 799. 1970; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1315, 1316, & 1320--1321. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Mahler, Key Vasc. Pl. Black Gap, ed. 3, 70. 1971; Moldenke, Fifth Summ. 1: 53, 59, 62, 63, & 76 (1971) and 2: 663, 690, & 918. 1971; Moldenke, Phytologia 22: 499 (1972) and 23: 192, 217, 242, 376, 414, & 436. 1972.

Recent collectors describe this plant as an erect perennial herb from a woody root, branched at the base, or an annual with fibrous roots, about 20 cm. tall, the stems erect or spreading, branching outward in age, the branches upright, stiff, and hairy or spreading, the bark green, the leaves spatulate, canescent, lobed and incised, the flowers not very showy, the corolla fairly small, and the fruit "a small capsule [it is actually a schizocarp]. Weaver notes that "the small flowers fall off easily on being collected". The corollas are described as having been "purple" on B. Hutchins 1051, L. Mitchell 130, D. W. Patterson s. n. [9 May 1966], and R. M. Stewart 1180, "pale to deep purple" on C. M. Rowell 5679, "pale-purple" on C. M. Rowell 8039, "pale blue-purple" on C. M. Rowell 5420, "purple or blue" on A. D. Wood 692, "pale-blue" on C. M. Rowell 8303, "bluish" on D. Hawkins 17 & 62, "light-blue" on B. Hutchins 351 & 361, "blue" on Boke & Massey 139, L. Galloway 35, Gipson 46, McCampbell 30, Pilcher 41 & 205, R. Runyon 2560, H. Thompson 62, Whitley 18, and J. M. Williams 77, "lavender-blue" on Meek 109, "violet-blue" on Forman 6 and McCrack-

en 101, "bright violet-blue" on R. V. Moran 11476, "bluish-violet" on Whitehouse 15341, and "pale blue-violet" on Rowell, Crum, & Cornett 8236 & 8242. Hutchins 351 & 361 are accompanied by photographs.

The chromosome number for *V. plicata* is given as $2n = 14$ by Lewis & Oliver (1961), Rattenbury (1962), and Bolkhovskikh and his associates (1969); the haploid number is reported as 7 by Solbrig, based on Solbrig 3179 from Reeves County, Texas. In addition to the months previously reported by me in this series of notes, the species has been collected in flower in January. Howell & McClintock (1960) state that in Arizona it blossoms from March to September. Rickett (1969) avers that in Texas it flowers from "February to September" and gives its distribution as "in open ground through much of Texas and westward to Arizona; and in Mexico". He adds that "'Plicate' refers to the lengthwise folding or grooving of the leaves" in this species and notes that "The flowers vary from blue to lavender and purple, about 1/4 inch across, the corolla not much longer than the calyx. *V. cloveri* has hairy stems, and corollas which greatly exceed the calyx."

Recent collectors have found *V. plicata* growing in sandy loam of mesquite grasslands and roadsides, alluvium along creek-beds, sandy soil or fine sandy silt, sandy loam limestone "derived along roadsides" in mesquite grasslands, in calcareous clay of barditch highways, limestone and gypsum gravels, the sandy soil of open fields and roadsides, the sandy or red sandy loam of canyon breaks, caliche soil, canyons, loose soil of sand mixed with clay, in the deep sandy loam of mesquite and oak shineries, in deep sand at the edge of woods along rivers, in hard sandy silt-marl, the sandy silt of open chaparral pastures, the loose or even deep sand of moving dunes, in red sandy loam of open grasslands, in shallow soils with rock and gravel, in open areas, and in limestone soil of *Prosopis-Rhus-Quercus* communities, on calcareous hillsides, sandy breaks, and sandstone ledges, at water's edge, among limestone and gypsum rocks, and along roadsides with *Festuca*, *Lesquerella*, and *Plantago*.

In Texas it is described by Weaver as "frequent in flat low areas among sand hills" and by Rowell as "occasional in tight sandy loam of mesquite pastures", "occasional among limestone rocks on the caprock and in adjacent rocky breaks with indicator species of the Chihuahuan Desert frequent", "locally frequent in red sandy loam", and "occasional in tight sandy loam of mesquite-juniper associations", while Rowell, Crum, & Cornett refer to it as "occasional herb along roadsides and in adjacent pastures" and "occasional among limestone rocks and in sandy loam". In Ward County it was found by Cory to be "frequent on roadsides", in Childress County by Meek as "occasional along roadsides", and in Garza County by McCracken as "infrequent in tight sandy rocky soil", by Rowell as "occasional in tight sandy loam along roadsides", and by McCampbell as "frequent in pastures", while Foreman says of it "found occasionally with other species of *Ver-*

vena". Ruryon found it to be "scarce" or "occasional on resea banks" in Cameron County.

In Mexico it is said by Moran to be "occasional in arroyos" in Baja California and in Coahuila Stewart found it "fairly common on gravelly flats", while Boke & Massey say it is "infrequent along roadsides and in arroyos". The type of V. plicata stricta appears to be Canales 11 from Andrews County, Texas.

Common names recorded for the species are "fanleaf vervain" and "whitevein verbena".

Material of V. plicata has been misidentified and distributed in some herbaria as V. gooddingii Briq. or V. neomexicana var. xylopoda Perry. R. Ruryon 4869 is a mixture with V. cloverae Moldenke. On the other hand, the B. E. Holland 21, Reséndez 55, and Rollins & Tryon 5841, distributed as V. plicata, are actually V. canescens var. roemeriana (Scheele) Perry, while Ramos & Murillo 52 is V. cloverae Moldenke.

Additional citations: TEXAS: Andrews Co.: Canales 11 (Lk); T. Collins 227 (Lk). Armstrong Co.: L. C. Higgins 4418 (N). Baylor Co.: D. W. Patterson s.n. [9 May 1966] (Lk). Brown Co.: Fryar 28 (Au--247719). Callahan Co.: N. C. Henderson 63-198 (Au--223174). Cameron Co.: Fleetwood 8142 (Au--243038); R. Ruryon 2463 (Au--265971), 4874 (Au--266160), 4888 (Au--266148). Childress Co.: Meek 109 (Lk). Cottle Co.: C. M. Rowell 5420 (Lk), 8605 (Lk). Crosby Co.: L. Galloway 35 (Lk); L. Mitchell 130 (Lk); Studhalter & Kendrick 1179 (Lk), 3324 (Lk). Culberson Co.: Matthews & Matthews 309 (Au--259932). Dawson Co.: Hargrove & Tilton HT. 500690 (Lk). Dickens Co.: C. M. Rowell 10289 (Lk); N. L. Weaver 10 (Lk). Duval Co.: Silva & Gonzales 43 (Au--245143). Ector Co.: T. Collins 69 (Lk); Reed & Studhalter 1922 (Lk). Gaines Co.: Hargrove & Tilton HT. 500678 (Lk); Rowell, Crum, & Cornett 8236 (Lk), 8242 (Lk). Garza Co.: Foreman 6 (Lk); Funson 28 (Lk); B. Hutchins 351 (Lk), 361 (Lk), 1051 (Lk), 1107 (Lk); McCampbell 25 (Lk), 30 (Lk); McCracken 101 (Lk); Nickell 62 (Lk); C. M. Rowell 5679 (Lk, Lk), 8039 (Lk), 10180 (Lk, Lk), 11590 (Lk); H. Thompson 62 (Lk); Vlaming 73 (Lk). Hidalgo Co.: R. Ruryon 2560 (Au--268712), 4869, in part (Au--269729). Howard Co.: Whitley 18 (Lk). Jim Hogg Co.: Botello & Ayala 12 (Ip); Ramos & Murillo 57 (Au--245125). Loving Co.: D. Hawkins 17 (Lk). Lubbock Co.: Demaree 7539 (Lk); Everett & Graham EG. 500321 (Lk); D. Hawkins 62 (Lk); E. L. Reed 3375 (Lk), 3391 (Lg); C. M. Rowell 8549 (Lk); J. M. Williams 77 (Lk). Mason Co.: Gipson 46 (Lk). Mitchell Co.: Pilcher 41 (Lk). Motley Co.: Hargrove & Tilton HT. 500630 (Lk). Starr Co.: Luz Campos 78 (Lk); Pilcher 205 (Lk); A. D. Wood 692 (Au--247063, Au--262608). Taylor Co.: N. C. Henderson 61-944 (Go), 63-153 (Au--225839); Mahler 3514 (Au--248881). Ward Co.: Cory 51970 (Mi, N). Webb Co.: Dickey 118 (Lk); Gonzalez-Arroyo

68 (Lk). Winkler Co.: C. M. Rowell 8303 (Lk, Lk). Young Co.: Whitehouse 15341 (N). Zapata Co.: L. R. Cuesta 61 (Au--244898, Ip); Guerra, Garcia, Garcia, & Salazar 607 (Au--244972, Ip); J. O. Perez 44 (Au--244835). MEXICO: Baja California: R. V. Moran 11476 (Sd--59702). Coahuila: Boke & Massey 139 (Mi); R. M. Stewart 1180 (Au--301986). Tamaulipas: Dominguez M. & McCart 8183 (Au--222205), 8225 (Au--222241); Escalante 37 (Au--222239).

VERBENA PLICATA var. DEGENERI Moldenke

Synonymy: Verbena plicata degeneri Moldenke ex Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970.

Additional bibliography: Moldenke, Phytologia 11: 477. 1965; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1316 & 1321. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Moldenke, Fifth Summ. 1: 59 (1971) and 2: 690 & 918. 1971.

VERBENA POGOSTOMA Klotzsch

Additional bibliography: J. F. Macbr., Field Mus. Publ. Bot. 13 (15): 614 & 628--629. 1960; Hocking, Pharmaceut. Abstr. 9 (3): item 1068. 1968; Moldenke, Phytologia 16: 196. 1968; Moldenke, Résumé Suppl. 16: 7. 1968; Moldenke, Fifth Summ. 1: 202 & 372 (1971) and 2: 690 & 918. 1971.

Pierotti collected this plant in anthesis and fruit in March. Macbride (1960) says "Type from garden material of Berlin-Dahlem, origin uncertain; seems, with V. Matthewsii, to be a part of V. laciniata". He cites Weberbauer 2723 from Ancash, Peru, and Weberbauer 5333 from Lima, the latter said to have been so determined at Dahlem, but the former said to have been identified as V. trifida by Hayek. Macbride suggests that the species may also occur in Paraguay. It would seem, therefore, that his interpretation of V. pogostoma differs considerably from mine. He also adopts the Schauerian modified spelling of the specific name, rather than the original.

Additional citations: ARGENTINA: Córdoba: Villafaffe 549 (N). Santiago del Estero: Pierotti 53 (N).

VERBENA PORRIGENS R. A. Phil.

Additional bibliography: Reiche & Phil., Fl. Chil. 5: 289 & 291. 1910; Cabrera, Bol. Soc. Argent. Bot. 5: 96. 1953; Moldenke, Phytologia 13: 254. 1966; Moldenke, Fifth Summ. 1: 193 (1971) and 2: 691 & 918. 1971.

xVERBENA PROSTIBULA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 21. 1964; Moldenke, Fifth Summ. 1: 372 (1971) and 2: 674, 695, & 919. 1971.

VERBENA PULCHELLA Sweet

Additional synonymy: Glandularia pulchella Sweet ex Solbrig, Pas-

sani, & Glass, Am. Journ. Bot. 55: 1235. 1968.

Additional & emended bibliography: A. Gray, Field For. & Gard. Bot., ed. 1, pr. 1, 242 (1868), ed. 1, pr. 2, 242 (1869), and ed. 1, pr. 3, 242. 1880; L. H. Bailey in A. Gray, Field For. & Gard. Bot., ed. 2, 341. 1895; E. L. D. Seymour, New Gard. Encycl., ed. 3, 1279 (1944), ed. 4, 1279 (1946), and ed. 5, 1279. 1951; Kuck & Tongg, Mod. Trop. Gard. 213. 1955; E. L. D. Seymour, New [Wise] Gard. Encycl., ed. 6, 1279 (1963) and ed. 7, 1279. 1964; J. A. Clark, Card Ind. Gen. Sp. Var. issue 248. 1964; Solbrig, Castanea 30: 173--174. 1965; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 134, 136, 137, & 139, fig. 46 C & D. 1965; Hocking, Excerpt. Bot. A.11: 123--124. 1967; Moldenke, Phytologia 16: 196--197. 1968; Moldenke, Résumé Suppl. 16: 22. 1968; Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1235--1239. 1968; R. F. V. Cooper in Pastore, Bol. Soc. Argent. Hort. 157: 125. 1969; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Angely, Fl. Anal. Fitogeogr. Est. S. Paulo, ed. 1, 4: 840 & xix. 1970; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1323. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Schnack & Rubens, Bol. Soc. Argent. Bot. 13: 206 & 207. 1970; E. L. D. Seymour, New [Wise] Gard. Encycl., ed. 8, 1279. 1970; G. Taylor, Ind. Kew. Suppl. 14: 63. 1970; Solbrig, Princ. & Meth. Pl. Biosystem. 75, 76, 148, 150, 157, & 158, fig. 5-1. 1970; Moldenke, Fifth Summ. 1: 178, 190, 193, 202, & 372 (1971) and 2: 522, 619, 621, 678, 691, & 919. 1971; Moldenke, Phytologia 23: 226, 227, 427, & 431. 1972.

Additional illustrations: Solbrig, Princ. & Meth. Pl. Biosystem. 76, fig. 5-1: 1970.

Schnack & Rubens (1970) record this species from Buenos Aires, Córdoba, Santa Fé, and La Pampa, Argentina, but I am not at all certain that the interpretation of V. pulchella held by these authors and certain other Argentinian botanists and cytologists coincides with mine. Troncoso (1965) gives the distribution of what she regards as the typical form of this species as "Sur del Brasil, Uruguay, centro y litoral argentino. Común en las barrancas del Paraná y en las sierras del sur de la Provincia [Buenos Aires]", and cites only Cabrera 7195 and Burkart 8490.

The corollas are said to have been "blue" on T. Meyer 6990. The Troncoso 353, distributed as V. pulchella, is actually what I regard as V. santiaguensis (Covas & Schnack) Moldenke.

Additional citations: URUGUAY: Herter 1805 (W--2563042). ARGENTINA: Buenos Aires: T. Meyer 6990 (N).

VERBENA PULCHELLA Sweet x V. ELEGANS H.B.K. ex Moldenke, Fifth Summ. 2: 919 & 970. 1971.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1236--1238. 1968; Solbrig, Passani, & Glass, Biol. Abstr. 50: 4151. 1969; Solbrig, Princ. & Meth. Pl. Biosystem. 148. 1970; Moldenke, Fifth Summ. 1: 370 (1971) and 2: 914, 919, & 970. 1971; Moldenke, Phytologia 23: 227 & 431. 1972.

Solbrig (1970) refers to a "Glandularia elegans x pulchella" hybrid having a fertility rate of less than 10 percent, whereas in what he regards as the true V. pulchella Sweet the fertility rate is 99 percent, as it is also in the true V. elegans H.B.K. Since one of the putative parental species is South American and the other is Mexican, this hybrid cannot be expected in the wild. However, if it proves to have acceptable horticultural merit it is possible that it may at some time be propagated horticulturally. as yet it has not been assigned a hybrid binomial name since I am in doubt as to the true identity of one of the parents. Examination of the material originally used in making the cross is urgently required and points up again the prime importance of herbarium vouchers being kept by all geneticists and cytologists engaged in plant breeding.

VERBENA PULCHELLA Sweet x V. PERUVIANA (L.) Britton ex Moldenke, Fifth Summ. 2: 919 & 970. 1971.

Synonymy: Glandularia pulchella x peruviana Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1238. 1968.

Bibliography: Solbrig, Passani, & Glass, Am. Journ. Bot. 55: 1238. 1968; Solbrig, Princ. & Meth. Pl. Biosystem. 148 & 158. 1970; Moldenke, Fifth Summ. 2: 918, 919, & 970. 1971; Moldenke, Phytologia 23: 427 & 431. 1972.

Solbrig (1970) describes a segmental allotetraploid hybrid between these two species as having over 70 percent fertility, while the diploid hybrid between the same two species has only less than 30 percent fertility. He states that natural hybrids between these two species are "occasionally seen in the field, but they are rare". He further states that "The cross between G. peruviana and G. pulchella.....was 42 percent pollen fertile, but in spite of this showed almost normal meiotic pairing. The differences are almost entirely due to small cryptic aberrations, as shown by the fact that the artificial allopolyploid had a pollen fertility of over 70 percent."

This hybrid has not yet been given an official hybrid binomial designation because of the doubt in my mind as to the true identity of the parent referred to as V. pulchella. Examination of the herbarium vouchers, if any were made, would be required to settle this point.

VERBENA PULCHELLA Sweet x V. SANTIAGUENSIS (Covas & Schnack) Moldenke, Fifth Summ. 2: 919 & 970. 1971.

Bibliography: Solbrig, Princ. & Meth. Pl. Biosystem. 518. 1970; Moldenke, Fifth Summ. 2: 919 & 970. 1971.

Solbrig (1970) refers to a hybrid between these two species: "Hybrids between G. santiaguensis and G. peruviana are 50 % pollen sterile (Solbrig, 1968). The reduced sterility is due to at least one translocation and probably also to small cryptic aberrations, because the chiasma frequency of the hybrid is lower than that of the parent, leading to the formation of approximately 4% of univalents (although the reduced chiasma frequency could, of course,

also be due just to the effect of the translocation or to some specific mutation). Very similar cytological behavior was found by Schnack and Covas (1945) in a hybrid between G. santiaguensis and G. pulchella.....On morphological grounds, G. santiaguensis and G. pulchella are more related to each other than to G. peruviana; chromosomally, however, G. pulchella and G. peruviana appear to be closer, although the genetic isolating barrier between all three species is about the same. It is evident that in this case morphological differentiation (and the genetic system underlying it) has developed at different rates in the three species than have the genetic and cytological factors producing reduced fertility in the hybrid."

VERBENA PULCHELLA var. CLAVELLATA (Troncoso) Shinnery

Additional bibliography: J. A. Clark, Card Ind. Gen. Sp. Var. issue 248 (1964) and 251. 1965; Troncoso in Cabrera, Fl. Prov. Buenos Aires 5: 139. 1965; Hocking, Excerpt. Bot. A.11: 124. 1967; Moldenke, Phytologia 16: 196. 1968; Moldenke, Fifth Summ. 2: 522, 919, & 968. 1971.

VERBENA PULCHELLA f. LATILOBATA Moldenke

Additional bibliography: Moldenke, Phytologia 13: 256. 1966; Moldenke, Fifth Summ. 1: 190 (1971) and 2: 919. 1971.

VERBENA PULCHRA Moldenke

Synonymy: Glandularia pulchra Moldenke, Phytologia 23: 431, in syn. 1972.

Additional bibliography: Angely, Fl. Anal. Paran., ed. 1, 573. 1965; Moldenke, Phytologia 16: 196. 1968; Angely, Fl. Anal. Fito-geogr. Est. S. Paulo, ed. 1, 4: 840 & xix, map 1395. 1970; Moldenke, Fifth Summ. 1: 178, 190, & 202 (1971) and 2: 919. 1971; Moldenke, Phytologia 23: 419 & 431. 1972.

Krapovickas and his associates found this plant growing "en pedregal al borde de un isleta, en selva, mata de ca. 80 cm. alt., flores rosadas".

Additional citations: ARGENTINA: Corrientes: Krapovickas, Cristóbal, Arbo, Maruffak, Maruffak, & Irigoyen 17226 (Rf).

VERBENA PULCHRA var. PALUDICOLA Moldenke

Additional bibliography: Moldenke, Phytologia 11: 27--28. 1964; Moldenke, Fifth Summ. 1: 190 (1971) and 2: 683 & 919. 1971.

VERBENA PUMILA Rydb.

Additional & emended bibliography: Lewis & Oliv., Am. Journ. Bot. 48: [639]--641, fig. 2. 1961; Hocking, Excerpt. Bot. A.6: 91 (1963) and A.7: 455. 1964; Moldenke, Phytologia 16: 196. 1968; Moldenke, Résumé Suppl. 16: 2. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 717. 1969; Rickett, Wild Fls. U. S. 3 (2): 364. 1969; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1318 & 1326. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found.

Bot. 6:] 1877. 1970; Mahler, Keys Vasc. Pl. Black Gap, ed. 3, 70. 1971; Moldenke, Fifth Summ. 1: 47, 53, 59, 60, 62, & 76 (1971) and 2: 657, 677, 689--691, & 919. 1971; Moldenke, Phytologia 22: 485 (1972) and 23: 188, 190, & 265. 1972.

Recent collectors describe this species as a low, spreading, herbaceous annual clinging to the ground or as a perennial spreading from a taproot, the stems partly decumbent and becoming widely branched. The corollas are described as "purple" on D. Hawkins 64, B. Hutchins 459 & 1020, L. McCracken 19, and D. W. Patterson s.n. [9 May 1960], "light-purple" on Perino & Pierson 209 and Youngblood 2, "purple-rose" on Shinners 26092, "pale blue-purple" on Rowell, Giddens, & Griggs 8085, "pale-purple" on C. M. Rowell 8038, "rose-purple" on Meek 56, "reddish-violet" on L. Mitchell 28, "rosy-lavender" on Foreman 5, "lavender" on Gipson 45, "light-red" on Pilcher 79, "rosy-pink" on D. Griffith 163, "pink" on Whitten 44, "pale-pink" on C. M. Rowell 5645, and "very pale-blue" on C. M. Rowell 5258. Lewis & Oliver (1961) and Bolkhovskikh and his associates (1969) report the chromosome number as $2n = 20$.

The plant has been found growing in light or red sandy loam or black rocky soil, shallow alkaline soil, loose sand, shallow soils with rock and gravel, disturbed rocky soils, rocky limestone soil or very rocky calcareous soil, in calcareous clay loam of eroded pastures and barditch highways, in cultivated areas by roadsides and disturbed areas in general, in cultivated grassland pastures, moist grassy depressions on open rocky slopes, in sandy loam grasslands with *Artemisia filifolia* and mesquite thickets, in juniper openings on rocky limestone slopes, among sandstone rubble and lava boulders, and on dry slopes and sand dunes.

Perino & Pierson refer to the species as "common" in Rogers County, Oklahoma. In Texas Nixon found it "in soils derived from granite, open areas in hilly terrain" (Gillespie County), McCracken reports it as "infrequent in ungrazed pastures and roadsides" (Ector County), Whitten calls it only "occasional on roadsides" (Childress County), Rowell, Giddens, & Griggs found it only "occasional on red sand and gravel hillsides" (Cottle County), Foreman reports it "locally very abundant in picnic areas" (Mitley County), Hawkins says "found frequently off caprock in sandy loam" (Lubbock County), and Pilcher & Williams found it "in red sandy loam of flat open mesquite grasslands" (Burnet County). In San Patricio County it is said by Rowell to be "an occasional herb in deep sands" and "locally frequent but not in large numbers in deep loose sand". Meek reports it very common along roadsides in red loamy soil. In Garza County Youngblood reports it "frequent along roadsides in red sandy loam", while Rowell says "locally frequent in red sandy loam" and "occasional in red sandy loam below caprock". In New Mexico it is said by Griffin to be "locally frequent on gravel-sandy roadsides".

The label accompanying Parks 51 is inscribed "very common in disturbed soil; bracts two to four times as long as the calyx", but the latter statement is not true of the two specimens mounted on

the sheet. Perhaps this is another case of mixed labels. T. Collins 91 is a mixture with V. wrightii A. Gray. A photograph accompanies B. Hutchins 459.

In the Hocking (1965) reference cited in the bibliography a typographic error has caused the binomial name of this species in abbreviated form to appear as "C. pumila".

Verben pumila, in addition to the months previously reported by me, has also been found in fruit in October. Material has also been misidentified and distributed in some herbaria under the names V. bipinnatifida Engl. & Gray, V. bracteata Lag. & Rodr., V. bracteata Log. & Rode, V. ciliata var. pubera (Greene) Perry, and V. hastata L. On the other hand, the Bolen 81 and C. Drake 22, distributed as V. pumila, are actually V. bipinnatifida Nutt., Whitehouse 9513 is V. ciliata var. longidentata Perry, R. Ruryon 2499 is the type collection of V. pumila f. albida Moldenke, K. Peterson 64 is V. quadrangulata Heller, and W. P. Taylor s.n. [3-31-44] is V. racemosa Eggert.

Additional citations: OKLAHOMA: Comanche Co.: Hopkins, Nelson, & Nelson 199 (Se--107249), 970 (Se--136589). Johnston Co.: G. T. Robbins 3256 (N). Murray Co.: Hopkins, Nelson, & Nelson 159 (Se--103965, Ws), 905 (Se--119710, Ws); G. T. Robbins 2449 (N, Se--153535). Rogers Co.: Perino & Pierson 209 (Au--302833). TEXAS: Armstrong Co.: C. M. Rowell 10766 (Lk). Atascosa Co.: E. J. Palmer 11231 (Au--122567). Bailey Co.: Rosson 505 (Lk). Baylor Co.: D. W. Patterson s.n. [9 May 1966] (Lk). Bexar Co.: Parks & Pladeck s.n. [April 7, 1940] (Ws). Brazos Co.: H. B. Parks 253 (Au--122493), s.n. [December 28, 1946] (Au--122494). Brewster Co.: Cory 28681 (Se--171757). Brown Co.: Faubion 6 (Au--247719); Geeslin 93 (Lk). Burnet Co.: Pilcher & Williams s.n. [Pilcher 117] (Lk). Callahan Co.: N. C. Henderson 63-28 (Au--222980). Cameron Co.: H. C. Hanson s.n. [Brownsville, January 30, 1919] (Ws); H. Parks Jr. 93/2816 (Ws). Childress Co.: Iltis, Moore, & Barkley 733 (Ws); Meek 55 (Lk); Whitten 44 (Lk). Clay Co.: Shiners 26092 (Ws). Coke Co.: Swift s.n. [Ft. Chadbourne, 1856] (W--2606303). Coleman Co.: Pruitt 210 (Au--122472). Cottle Co.: Rowell, Giddens, & Griggs 8085 (Lk). Ector Co.: T. Collins 91, in part (Lk); L. McCracken 19 (Lk); L. Mitchell 28 (Lk). Edwards Co.: Cory 53678 (Mi). Foard Co.: C. Turner 14 (Au--247714). Garza Co.: B. Hutchins 459 (Lk), 1020 (Lk); C. M. Rowell 5672 (Lk), 8038 (Lk); Youngblood 2 (Lk). Gillespie Co.: Nixon G.43 (Au--253192). Gonzales Co.: Johnston & McCart 5226 (Ws). Hill Co.: Pilcher 79 (Lk). Jim Hogg Co.: I. Moran 10 (Lk). Kerr Co.: Gould 8455 (Lk). Llano Co.: Ohlenbush 40 (Au--219536). Lubbock Co.: Bolen 59 (Lk); D. Hawkins 64 (Lk); F. Parks 51 (Lk); E. L. Reed 1637 (Lk); Studhalter 1118 (Lk, Lk). Mason Co.: Gipson 45

(Lk). McCullough Co.: Studhalter & Camp 1109 (Lk). Motley Co.: Foreman 5 (Lk). San Patricio Co.: C. M. Rowell 5258 (Lk), 5645 (Lk). San Saba Co.: Calhoun 9 (Au--248067). Scurry Co.: M. Winter 61 (Lk). Tarrant Co.: A. Ruth 110 (Ws). Taylor Co.: N. C. Henderson 62-50 (W--2604067), 63-21 (Au--222982). Throckmorton Co.: Gould 9083 (Lk). Travis Co.: E. Hall 431 (Pa); B. C. Tharp 49-1118 (Au--122469). Uvalde Co.: E. J. Palmer 13562 (Ws). Wichita Co.: Whitehouse 9664 (N). County undetermined: Cory 27905 [Phantom Lake] (Se--113331). NEW MEXICO: Lea Co.: D. Griffin 163 (Lk). MEXICO: Nuevo León: Canedo, Garza, Gonzales, & McCart 9053 (Lk). Sonora: H. D. Ripley 14281 (N).

VERBENA PUMILA f. ALBIDA Moldenke

Synonymy: Verbena pumila albida Moldenke ex Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970.

Additional bibliography: Moldenke, *Phytologia* 14: 294. 1967; Rickett, *Wild Fls. U. S.* 3 (2): 364. 1969; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1318 & 1326. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Moldenke, *Fifth Summ.* 1: 60 (1971) and 2: 691 & 919. 1971.

Runyon reports that this form is "frequent throughout Cameron County" [Texas] and "it is frequent but not common", flowering from January to April. He describes it as "prostrate or ascending herb, in sand, alt. 10 m.; flowers white, in terminal panicles, no odor; leaves deltoid to ovate, short petioles; fruit a small nutlet; bark green; roots fibrous" and notes that "in the sandy region this plant roots freely at the nodes, in open ground, fields, etc." It has been misidentified and distributed in some herbaria as typical V. pumila Rydb.

Additional citations: TEXAS: Cameron Co.: R. Runyon 2366 (Au--268733). Kenedy Co.: R. Runyon 2359 (Au--268732), 2499 (Au--268821--isotype).

VERBENA QUADRANGULATA Heller

Additional synonymy: Verbena quadrangulata Heller ex Moldenke, *Fifth Summ.* 2: 708, in syn. 1971.

Additional & emended bibliography: Parks, *Tex. Agr. Exp. Sta. Bull.* 155: 112--113. 1937; Lewis & Oliv., *Am. Journ. Bot.* 48: [639]--641, fig. 3. 1961; Hocking, *Excerpt. Bot. A.* 6: 91. 1963; Moldenke, *Phytologia* 16: 196--197. 1968; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 717. 1969; Rickett, *Wild Fls. U. S.* 3 (2): 364. 1969; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1316 & 1322. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Moldenke, *Fifth Summ.* 1: 60 & 76 (1971) and 2: 527, 672, 691, 692, 708, & 919. 1971; Moldenke, *Phytologia* 23: 367. 1972.

Runyon describes this plant as an "annual, low prostrate or as-

ending herb, bark green or pale-green, roots fibrous, leaves oval in outline, dissected and lobed or deeply lobed, bright-green, flowers small, in rather compact spikes; fruit a conical-cylindrical capsule....widespread in dry soil....the plant is frequent or very abundant throughout this region [Cameron County, Texas], sometimes it covers small areas of ground....frequent on clay slopes and hilltops in Hidalgo and Starr Counties". The specific epithet is sometimes written with an uppercase initial letter for no good reason. The corollas are described as "blue" on Rollins & Tryon 5895 and as "white" on R. Runyon 1780, 3496, 2561, & 4876. Lewis & Oliver (1961) and Bolkhovskikh and his associates (1969) report the chromosome number as $2n = 20$.

The plant has been collected at altitudes of 30 to 3000 feet, growing in sandy loam, black clay, brick-red loose sand, sandy silt, gravel, black or red soil, sandy well-drained soil, on gravel outwashes, in sandy or fine sandy soil, in open chaparral pasture, and at water's edge. Material has been misidentified and distributed in some herbaria as V. plicata Greene.

Parks (1937) calls V. quadrangulata "A small-flowered pink verbena native to the Gulf Coast where it takes the place of V. bipinnatifida. Because of the differences in shade of color, this plant should be introduced into yard and park work to get a variation in color. It is easily grown from seed but can be purchased or collected anywhere along the Gulf Coast."

The Canedo, Garza, Gonzales, & McCart 9053, I. Moran 10, and C. M. Rowell 5258, distributed as V. quadrangulata, are actually V. pumila Rydb., R. Runyon 2359 & 2366 are V. pumila f. albida Moldenke, and E. Rodriguez 57 is not verbenaceous.

Additional citations: TEXAS: Cameron Co.: R. Runyon 1780 (Au--269675), 2496 (Au--268739), 4876 (Au--269676). Hidalgo Co.: R. Runyon 2561 (Au--268735). Kleberg Co.: Ramirez & Cardenas 78 (Au--245203); R. Runyon 4284 (Au--269672). LaSalle Co.: Cory 28549 (Se--113348). Starr Co.: Luz Campos 79 (Lk). Webb Co.: Barrera & Laurel 61 (Lk); D. Cardenas 57 (Lk); B. Gutierrez 50 (Lk). Zapata Co.: M. Gonzalez 2 (Ip). MEXICO: Nuevo León: Rollins & Tryon 5895 (Au--300175). Tamaulipas: Dominguez & McCart 8182 (Au--222247); Escalante 36 (Au--222215); M. Garza 36 (Au--222271); Ibarra 107 (Au--235237); K. Peterson 64 (Au--230288).

VERBENA RACEMOSA Eggert

Additional bibliography: Hocking, Excerpt. Bot. A.1: 430 (1959) and A.6: 91. 1963; Moldenke, Phytologia 16: 197. 1968; Bolkh., Grif, Matvej., & Zakhar., Chrom. Numb. Flow. Pl. 717. 1969; Rickett, Wild Fls. U. S. 3 (2): 364. 1969; Moldenke in Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1317 & 1325. 1970; Correll & Johnston, Man. Vasc. Pl. Tex. [Contrib. Tex. Res. Found. Bot. 6:] 1877. 1970; Mahler, Keys Vasc. Pl. Black Gap, ed. 3, 70. 1971; Moldenke, Fifth Summ. 1: 60, 62, & 76 (1971) and 2: 658, 691, 692, 700, & 919. 1971; Mol-

denke, *Phytologia* 22: 499 (1972) and 23: 374. 1972.

Rickett (1969) describes this species as having "several more or less erect, downy stems, sometimes blooming when only an inch tall. The leaves are small, variously cleft several times into narrow lobes. The bracts are shorter than the calyx and fringed with hairs. The corolla is white, less than 1/2 inch long, and not more than 1/4 inch across." He avers that it blooms in Texas from January to June, "in deserts and on hills in central and western Texas".

The plant has been found by recent collectors in rocky limestone loam, on the Chihuahuan desert, and in sotol-lechuguilla associations, fruiting from March to May, at 2000 feet altitude. Cory describes it as having "stems branched at base, the branches procumbent, to 2 dm. long or more.....frequent on highway or road shoulders" in Brewster County, Texas. The corolla is described as "white" on Cory 53209, Devor 261, Leverich 41, Meebold 26296, and C. M. Rowell 11228. Material has been misidentified and distributed in some herbaria under the names V. canescens H.B.K., V. neomexicana (A. Gray) Small, V. plicata var. plicata Devor, and Verbina ciliata Benth. On the other hand, the Cory 28550, distributed as V. racemosa, is actually V. ambrosifolia Rydb.

Additional citations: TEXAS: Brewster Co.: Cory 53209 (Mi, N); Devor 261 (Lk); Leverich 41 (Lk); C. M. Rowell 11228 (Lk); W. P. Taylor s.n. [3-31-44] (Au--122471). Pecos Co.: Cory 53500 (Mi), 53501 (Mi), 53502 (Mi); Tharp & Havard 49359 (N). Reeves Co.: Moore & Moore 4 (Se--119543); Nelson & Nelson 4985 (Se--118707). NEW MEXICO: Dona Ana Co.: Meebold 26696 (N).

VERBENA RADICATA Moldenke

Additional & emended bibliography: Reiche & Phil., *Fl. Chil.* 5: 295. 1910; J. A. Clark, *Card Ind. Gen. Sp. Var. issue* 183. 1944; Schnack & Covas, *Darwiniana* 7: [71], 72, 74, & 75, pl. 4 B. 1945; Troncoso in Böcher, Hjerting, & Rahn, *Dansk Bot. Arkiv* 22 (1): 109. 1963; Moldenke, *Phytologia* 14: 295. 1967; Bolkh., Grif, Matvej., & Zakhar., *Chrom. Numb. Flow. Pl.* 715 & 717. 1969; Schnack & Rubens, *Bol. Soc. Argent. Bot.* 13: 206. 1970; G. Taylor, *Ind. Kew. Suppl.* 14: 142. 1970; Moldenke, *Fifth Summ.* 1: 193, 202, & 372 (1971) and 2: 522, 692, & 919. 1971; Moldenke, *Phytologia* 22: 466 (1972) and 23: 419 & 427. 1972.

Beale (1940), Schnack & Covas (1945), and Bolkhovskikh and his associates (1969) all record the chromosome number of this species as $2n = 10$.

VERBENA RADICATA var. GLABRA (Hicken) Moldenke

Additional bibliography: Troncoso in Böcher, Hjerting, & Rahn, *Dansk Bot. Arkiv* 22 (1): 109. 1963; Moldenke, *Phytologia* 13: 258. 1966; Moldenke, *Fifth Summ.* 1: 202 (1971) and 2: 692 & 919. 1971; Moldenke, *Phytologia* 23: 419. 1972.

[to be continued]